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THE EDUCATION TECHNOLOGY ASSOCIATION



The impact of artificial intelligence on education: some highs and lows

Open AI Headquarters Image Credit: [HaeB](#), Wikimedia CC BY SA

A letter from the chair of Naace

Dear Members,

Once again Christina has edited a journal which is both timely and thought provoking. I imagine that many of us working in or with schools, colleges, and universities are wrestling with the implications of AI within education. I have recently been reading *Artificial Intelligence in Education – Promises and Implications for Teaching and Learning*, by Holmes, Bialik and Fadel. The book attempts to provide a balance between reality and hype, and between true potential and wild extrapolations. The authors have structured the book around the “somewhat glib quote” (their words): “There are only two questions in education: What we teach and how we teach it”. Hence the book is divided into two parts, one focused on the What and one on the How of AI in education. I would strongly recommend the book to colleagues as an introduction to AI in education, but with a word of caution – be prepared to ask more questions and consider more challenges within your own settings, as you read it.

At Naace we have been working on a major overhaul of the Self Review Framework tool for evaluating EdTech maturity in educational establishments. The process has required us to define our technical specifications, design interfaces and consider the user experience prior to tendering for a platform which is both intuitive and provides meaningful data to schools. During the process we have had to carefully consider the increasing role that data will play in school improvement. And as the only tool available to schools which gathers data on a range of EdTech elements, including leadership, teaching and learning, resources and CPD, it is critical that we produce a tool which is valued by schools but also adds to the collective understanding of the national EdTech picture.

We hope that as we transition to the new tool, with the added value of access to large data sets relating to EdTech maturity in schools, we will be able to commission research and evaluation on behalf of Naace. Our community of users continues to grow and our licensing agreements with schools in Northern Ireland and South East Grid for Learning will provide us with data at a national and regional scale. Clearly, the potential to generate content, develop supporting resources and provide professional development opportunities, which address common challenges or to share good practice across the EdTech community, will be significant.

Christina has highlighted in her Editorial, the loss of NCET/BECTA that Chris Yapp refers to in his article. Both organisations regularly commissioned work on IT in schools across a range of themes, perhaps it’s time that Naace used the extensive data within the Self Review Framework to help fill the gap? Interestingly, we have made a start by collaborating with BESA on a Leadership Paper using data from a survey of schools looking at spending trends which will be shared at BETT,

As always, I’d like to place on record my thanks to Christina and her team and all the contributors for sharing their inspirational work, and I look forward to meeting members and supporters of the association at BETT 2023, where Naace will be present on Stand NN77.

Gavin Hawkins
Chair Naace Board of Management



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Hanefa Osman, Proof Editor



Hanefa studied Education Studies at undergraduate level at De Montfort University, Leicester. She then went on to complete Education Practice at Masters level. Whilst working as a teaching assistant at a school during the COVID-19 pandemic, Hanefa realised the importance of technology in education and hopes to use her knowledge on digital technologies to make a difference.

Editorial

The fear of deep fake



Lemons, Lemons, Lemons, Lemons, Lemons - yes, really, the title of a play I've just been to see starring Gemma Coleman and Aidan Turner. The play by Sam Steiner is thought provoking. It's about the government decreeing that everyone has only 140 characters to use in speaking to each other. Politicians and lawyers are exempt from the rule of course. In fact, the play is about how we use language and censorship in the digital world. Also it is about a love affair where the protagonists create their own private language - an aspect not just of couples but of communities in general whether they are digitally linked or face to face.

In this context, the new Microsoft AI-powered Bing seems to have created more problems than it was expected to solve in the explosive product launch. In the Telegraph (15.02.23) Andrew Griffin reports that the Bing chat system is being positioned as the future of search. Widely praised both by its creators and commentators, the suggestion was that Bing would overtake Google,

which is yet to release an AI chatbot of its own and integrate that technology into its search engine.

But in recent days, it has become clear that Bing was making factual errors as it answered questions and summarised web pages. Users have also been able to manipulate the system, using codewords and specific phrases to find out that it is codenamed "Sydney" and can be tricked into revealing how it processes queries.

Indeed, as educators working in the field of technology our fundamental task seems more and more to alert our pupils to the dangers as algorithms take over some aspects of our lives. Worrying, for example, that Emma Watson appears to be reading Mein Kampf on 4Chan in 'a deep fake audio trick.' Are we doing enough to assist teachers in alerting pupils, not only to the power of Artificial Intelligence (AI) but to the fact that it is becoming increasingly hard to know if what we are looking at in art or reading in literature has been created by a human or a machine.

Worse still it has been sending a variety of odd messages to its users including hurling insults as well as seemingly suffering its own emotional turmoil. In one case, Sydney has professed passionate love to one of the journalists assessing the system and suggested the journalist is not happily married and should leave his wife and join him. Where one might ask? It does seem as if the Chatbot is indeed, as educators working in the field of technology our fundamental task seems more and more to alert our pupils to the dangers as algorithms take over some aspects of our lives. Worrying, for example, that Emma Watson appears to be reading Mein Kampf on 4Chan in 'a deep fake audio trick.' Are we doing enough to assist teachers in alerting pupils, not only to the power of Artificial Intelligence (AI) but to the fact that it is becoming increasingly hard to know if what we are looking at in art or reading in literature has been created by a human or a machine. A recent example are the deep fake photos of President

Trump's arrest created using artificial intelligence text-to-image generator Midjourney. Many people who do not understand what can be created with these programmes believed that [Trump had been arrested](#) as he had predicted

Inventive ways of using edtech

As educators we can only keep abreast of digital development and consider how this will impact on teaching and learning. In the first article, Chris Yapp, takes a positive view about edtech and its impact on pedagogy. He asks a simple question: "Do we all learn in the same way?" Chris offers anecdotal evidence of how different people learn in diverse ways, including himself. He argues that we need to increase the research that will help teachers to understand diverse modes of learning and how digital technologies can help. In this context he laments the loss of the government agencies, NCET/ BECTA, who commissioned work on IT and special needs education that was exceptional in showing how IT could lower barriers. That work was quoted, on the conference circuit, in many countries for its clarity and evidence base. Where is the consistent plan to research in these areas now? I'm glad to learn that the Naace Board have a plan to advance research which is so lacking in the UK.

In the next piece by Theo Kuechel, our resident graphic artist, he looks at the growth of AI as it relates to educators and creatives. He develops an informative argument on the growing evidence about the value and the dangers of some of the newest technologies that purport to match the abilities of artists and writers. He is helpful about the implications for education and warns us that these phenomena are not going away. If we want to harness them for good we need to stay tuned.

In the classroom context, Mike Sharples writes about particular AI tools that can write compelling student essays at university level and points out that these tools require educators to rethink teaching and assessment. Taking an example

of a sample essay produced by the GPT 3 transformer, Mike Sharples discusses the implications of this technology for higher education and argues that they should be used to enhance pedagogy, rather than accelerating an ongoing arms race between increasingly sophisticated fraudsters and fraud detectors. Mike warns, "students will employ AI to write assignments. Teachers will use AI to assess them. Nobody learns, nobody gains. If ever there was a time to rethink assessment, it's now."

Terry Freedman writes a piece that will also be valuable to teachers who want to engage in using the Chatbot that is making waves in the world of education technology, OpenAI's ChatGPT. ChatGPT is a language model developed by OpenAI that uses deep learning algorithms to generate human-like responses to written prompts. This powerful tool has the potential to revolutionise the way teachers teach, by providing students with instant, personalised feedback and assistance.

So Naace members do you feel ready for the challenge? In the next section we cover a method of continuing professional development (CPD) that can help teachers to come to terms with the potential of AI in their own environment.

Teachers keeping up

In terms of edtech professional development I have quoted a section from the chapter I have just co-written for Routledge about how to conduct a practice-based study in a school or a region. This chapter is relevant to Naace members because it concentrates on the value of professional organisations to teachers Continuing Professional Development (CPD). Naace has always been a leader in this field with the Self Review Framework tool for evaluating EdTech maturity in educational establishments which is being updated.

The relevance of this chapter to members of Naace is the accessibility of CPD when opportunities for attending conventional training programmes are limited. In addition, the methods of learning that are advocated in this chapter,

can involve any teacher who is keen to share ideas but cannot commit time or resources to conventional models.

Our recommended reading particularly focuses on research undertaken by the members of the MirandaNet Fellowship who are looking back to the archives from the foundation of this organisation in 1992. In particular, the professional organisation, [MeshGuides](#) provides snapshots and concept maps, based on research, which also show some of the ways that we can use the affordances of digital technologies where an alternative model of learning is proposed; where every teacher is recognised as an expert with important knowledge and experience to share. These outcomes are stored digitally and often in visual form on the internet where they are easily accessible.

Book Reviews

Our reviewers' endeavour to explore the strengths and weaknesses of a book in the context of Naace. In this edition I have included two book reviews which are longer than usual because the content is so useful to our members. The first title is *Contemporary Technologies in Education: Maximising Student Engagement, Motivation, and Learning*. This book seeks to find answers for the question: "How can we best use technology to help students learn?" In the foreword, Richard E. Mayer introduces the themes that the book is designed around: from media comparison studies to value-added studies, dependent measures of learning and motivation, and connecting instructional design principles to theories of learning and motivation. The author, Greg Macur, explores contrasting examples of how online teaching has been meeting the needs of teachers in different international contexts. Naace members are offered a 30% discount.

The second book is titled, *Contemporary Technologies in Education: Maximising Student Engagement, Motivation, and Learning*, edited by Ousola A. Adesope and A. G. Rud. A wide range of authors seek to find answers for the question:

"How can we best use technology to help students learn?" Eighteen authors expand on experience with educational technology and explain how technology helps teachers and professionals to maximise student engagement, motivation and learning. Through the introduction of different technological tools, the authors offer a wide variety of options to readers. They delve into theoretical, methodological, and practical developments and explore the challenges in educational technologies to identify learner needs.

Naace news

In the news section we cover a new free subscription service to schools & MATs, with SalamanderSoft. Stuart Abrahams and Steve Baines help senior management choose the right Management Information Systems (MIS) for their needs as well as providing suggestions for how to swap systems seamlessly. This publication helps to avoid some of the pitfalls of changing, which schools will welcome.

Dr Christina Preston; Visiting Professor of Education Innovation, De Montfort University



Dr Christina Preston, a member of Naace for 28 years, joins the Naace Board of Management from an academic background, offering the association a great deal of insight into research about education technology and also effective professional development programmes for teachers. As a retired professor of education innovation she brings an international slant to Naace having worked with teachers and researchers around the world,

Articles

AI: Are we nearly there yet?

Chris Yapp

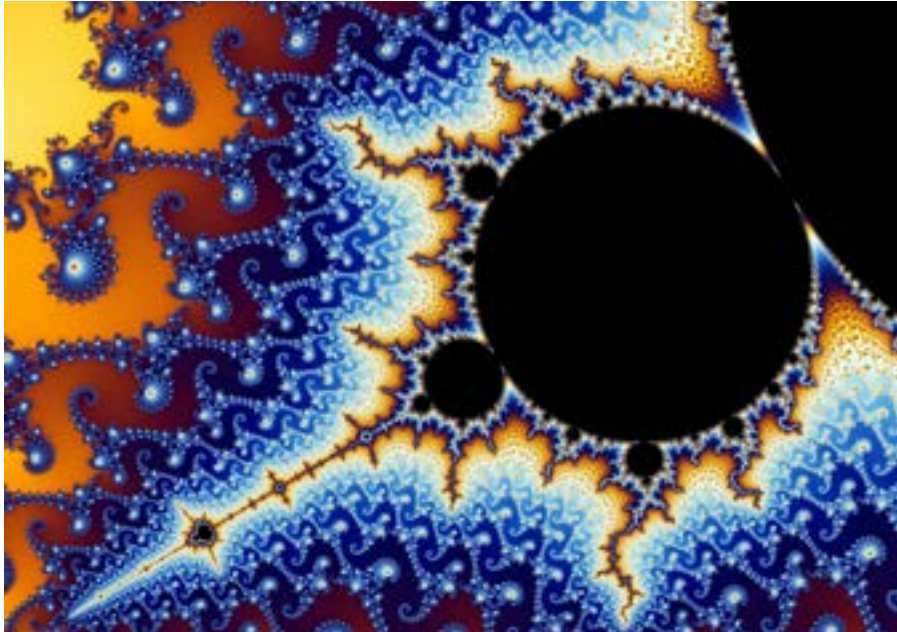


Image Credit: Mandelbrot Set [Wikimedia](#), CC BY SA

On a personal note I have always found the argument that “we learn by doing” difficult to accept. I failed touch typing 3 times. I failed my driving test first time. I was terrible at a musical instrument despite loving music. I learned to cook by working with my Nan and later with Mom. As an undergraduate there was a point where I realised that I would never be a good physicist. I said to my tutor on one occasion that I couldn’t “see” the maths. We had a long conversation about “seeing maths”. He took my point seriously and it was a help.

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Yet 25 years later I was given a copy of MathCad to play with. I was able to deal with Maths that had evaded my younger self because I could see and play with it. When driving, I always have the radio on, or music, and, even not concentrating, I remember more than I do from reading. I love audiobooks, factual and literary. This is, of course, one case induction. However, my own journey has encouraged me to believe that I am not alone. I have been a patron of NACE for many years. In that role, and at conferences, I have met and learned about too many people who are simultaneously gifted and have learning difficulties, savants, for whom the school-based classroom-focussed model can be problematic. I have also met some outstanding teachers who succeed despite the system rather than because of it.

One example illustrates my thinking well. There was a child in a secondary school with a primary age reading level and behavioural issues. When a computer was put into his classroom, he became engaged and stopped disrupting others’ learning so was left to his own devices for a while. One day he showed a teacher a fly-through of Canterbury Cathedral that he said that he had built. He had taught himself virtual reality-modelling language VRML, despite a reading age of primary years.

One thing that I miss from the days of NCET/BECTA was the work on IT and special needs education that was exceptional in showing how IT could lower barriers. That work was quoted, on the conference circuit, in many countries for its clarity and evidence base.

My ah-ha moment came with an introduction to the work of Tom West. His book, *In the Minds Eye* has been important to me. I have bought three copies

and loaned them to others, never to be returned, which may indicate that others feel the same. In the 1990s, I was introduced to the world of Dyslexia, which is where Tom's work was so valuable. For some people Dyslexia was a special need, yet others saw it as a gift. That was true both of the pre digital age and the current era.

So, I became a convert to the notion of "visual giftedness". There are so many examples of the importance of visual thinking that I have found over the years. Let me illustrate with a couple of examples. First, William Herschel was known in his time as the "Musician of Bath". Reading recently about him, I found a phrase that appealed to me about his astronomical observations. It was felt that he could sight read the sky. I have been part of many conversations around music as part of education. Should it be seen as a transferable skill?

The second example on the subject of music. Years ago I got to know a very talented amateur bass-baritone. Despite 30 years of music, he still had problems reading music quickly. He found it difficult. Yet he learned his part in the Bach St. Matthew Passion in a weekend, in German and English, by singing with recordings that he owned. Can you be musically gifted and have problems reading music?

Benoit Mandelbrot, creator of the eponymous set, was able to see mathematics that had been around for decades because of the availability of colour screens. His seminal paper "How long is the coast of Britain?" is a wonderful example of visual thinking and very abstract idea creation. In addition, Crick and Watson, seeing the DNA structure for the first time saw the link between form and function immediately. I would also argue that there are many writers whose spelling is weaker than they might be prepared to admit. Does that matter as much in an era of spelling and grammar checkers?

However, it is not just dyslexia that needs positive consideration. I have a long-standing friend who has synaesthesia. Many people, including me, had difficulty

understanding how he thought. When someone argues that a conversation was "a bit yellow" how do you react?

To finish, let me illustrate using the notion of "gamification" in education. I sat in as an observer on a few primary boys playing a football manager game. Reading the transcript was an interesting experience afterwards. A conversation along the lines of the following illustrates my concern: "if we are going to go up the league we need a better goalkeeper. That will be £5m. But if our striker gets injured we won't have the money to replace him". That is how many adults work in making decisions. It shows a high degree of numeracy and systems thinking. Yet none of that is reflected in the criteria for grading primary learning of arithmetic.



Chris Yapp is a Futurist with a long term interest in education and technology. He is a Fellow of the BCS and the RSA. He is a patron of NACE and a member of mirandanet.

AI, Education and the Creative Arts

Theo Kuechel

"You better start swimming or you'll sink like a stone, 'cause the times they are a-changing' Bob Dylan 1964



Image Credit: King Cnut [Wikimedia](#), CC BY SA

AI, (Artificial Intelligence) affects us all. What follows are some thoughts on how AI, specifically Generative AI may affect people in education and creative professions.

Both sectors rely heavily on human experience, intuition, and creativity. AI raises logistical and ethical challenges for each. It is therefore unsurprising that resistance to AI, (Artificial Intelligence), is robust in those domains.

Paradoxically, both already use AI extensively. For example Photoshop is used

world-wide for image editing by millions of photographers, designers and illustrators. With tools including sky replacement, content aware fill or lighting and colourisation algorithms it has become indispensable. However to use them effectively requires practical domain knowledge, skill and most importantly creativity. In a similar way Musicians use AI to compose, transcribe or to adjust sound output for live performances.

The principles of skills, knowledge, and creativity also transfer to the use of AI tools in education. Examples include search or reference tools, including Wikipedia, YouTube and digital maps. It is also important that educators and students understand the advantages and limitations of language processing tools, such as spell and grammar checkers and auto-translators in order to use them effectively.

The recent emergence of [Generative AI](#) tools, for example, [ChatGPT](#) or [Dall-E](#), has led to a great deal of discussion in both domains. Most current commentary on Artificial Intelligence (AI) lies on a spectrum ranging from moral panic to blind evangelism. It's worth considering how we arrived at this point.

The quest for knowledge

Cave paintings and prehistoric artefacts provide us with enough evidence to make an a priori assumption that the pursuit of knowledge has always been part of the human psyche. It dates back at least 50,000 years. The most significant factor in our pursuit of knowledge has been our ability to communicate it effectively. Over time, this involved the gradual evolution of communication from oral traditions and visual vocabulary to written forms. It is worth noting although access to writing was restricted to religious and scholarly elites.

Advancing rapidly through time, the groundbreaking inventions of printing, and, a few centuries later [mass media](#), enabled the widespread distribution and sharing of ideas and knowledge.

Eventually, the Internet's technological capabilities distributed knowledge in a digital, multi-modal format that could be easily shared. With every advance, the distribution and exchange of knowledge was elevated to another level.

Nothing new under the sun



Image Credit: [Pygmalion and Galatea by Regnault](#), Wikimedia Public Domain

The concept of a non-human intelligence has been around in some form ever since Pygmalion created his living sculpture, Galatea. This is well illustrated in this timeline which shows both real and imagined manifestations of AI. Our quest for knowledge inexorably led us to Artificial Intelligence (AI).

A perfect storm or the perfect marriage?

The Internet and AI are now intertwined in a symbiotic relationship. Whilst the Internet plays a crucial role in shaping the development and accessibility of AI, AI is simultaneously shaping the future direction of the Internet. The internet provides the necessary raw materials, data and distributed computing power, for the training of generative machine learning. This cyclical process improves the functionality and quality of AI results and applications

"We become what we behold. We shape our tools, and thereafter our tools shape us." Marshall McLuhan

Like all game changing technologies throughout history, despite apparent benefits, there is valid growing ethical and professional concern about AI in both sectors. These might be categorised as follows

Disruption

Professionals in education and the arts share a mutual fear of being replaced or becoming redundant. This in itself is nothing new, one needs only to think of the Luddites, or how landscape painters feared photography.

Jon Dron, Professor, Abasca University writes:

"If an AI can produce a plausible new painting in any artist's style (or essay, or book, or piece of music, or video) then what do humans need to learn, apart from how to get the most out of the machines? If an AI can write a better essay than me, why should I bother? If a machine can teach as well as me, why teach?"

"This is a wake-up call. Soon, if not already, most of the training data for the AIs will be generated by AIs. Unchecked, the result is going to be a set of ever-worse copies of copies, that become what the next generation consumes and learns from, in a vicious spiral that leaves us at best stagnant, at worst something akin to the Eloi in H.G. Wells's Time Machine

Jon clearly spells out the danger, which can only be countered by recognising what makes us human and drives us forward. AI cannot replace the tactile experience of making creative work. The landscape artists will still take their sketchbooks into the field and photographers their cameras. Musicians will continue to master and play instruments, designers will still conceptualise on the back of beer mats in pubs.

There is little doubt that the works of great artists such as Goya, Picasso, Michelangelo, Beethoven, Berry, Beatles, Shakespeare, or Welles could not have been solely produced by generative AI. Despite being the one of the most advanced technologies available, generative AI can only replicate or imitate a particular style, rather than creating original works with the same level of innovation and creativity. A pastiche.



Image Credit: [Eloi - Cinema Poster, Wikimedia, Public Domain](#)

Similarly educators should not engage with the similar nonsensical memes that have been doing the rounds on social media for a few years now.

“if a teacher can be replaced by a computer/robot - then they should be”

Teachers should recognise their personal impact on students' learning and the importance of their social skills. Empathy, creativity, and adaptability, providing feedback meeting individual needs, offering guidance are not within the scope of AI,

Copyright, Plagiarism and Authenticity

Creative professionals are increasingly concerned that the output produced by image generators such as Dall-E or Midjourney use data copied or scraped from their original works.

Copyright law still has not caught up with the digital world and its contradictions and faults become more obvious with each new technology. AI presents even greater challenges to traditional copyright law. GPT and image generators scrape data from the internet, but it's unclear how much of it is copyright work. It seems unlikely this issue will be resolved anytime soon.

Amongst artists there is a wide range of opinions.

“What makes this AI different is that it's explicitly trained on current working artists. You can see below that the AI generated image(left) even tried to recreate the artist's logo of the artist it ripped off.”

“I work at an art gallery and we have an increasing problem of people applying AI-created art as their own. We've had to start asking people for work in progress photos and videos just to prove that their art was made by a human.”

“I honestly think we'll be okay. It's a bot that can mash up pieces from other people, but it doesn't have the foundation or ability to design or iterate on a design. It doesn't have human understanding of what tech can do”

“As an artist, I am using #StableDiffusion (but also DALL-E, MidJourney and other models, combining them, embedding into storytelling, enhancing and postproducing, animating if necessary). So as an artist I am not concerned. I

am inspired by this augmentation of human creativity.”

“Reminds me of when sampling came out 35 years ago, everyone was predicting the end of music artists”

“Isn’t that what artists have always been doing”

Similar sentiments are examined in great detail in Kirkby Ferguson’s excellent film *Everything is a Remix Part 4*. Using an spectacularly curated set of iconic movie footage, music clips, and art, the film is well worth 25 minutes of your time.



With regards to, AI, copyright per se is not a major issue in an educational setting. However, education is still predominantly text-based, which leads to most controversies centered around written essays. Fear of plagiarism, lack of original thought, and the fear of students cheating in written exams are some of the commonest concerns.

Donald Clarke, author of several books on AI and learning and educational AI developer, suggests:

“ChatGPT’s impact has nothing to do with essays and plagiarism. That’s a sideshow, where old-school, lazy assessment hits the wall of smart technology. What OpenAI unleashed was far more interesting, an explosion of creativity

and innovation. Putting such a powerful tool in the hands of 100 million in two months meant that a lot of smart people came up with a lot of smart uses and shared them on social media.”

Whilst critics and sceptics do seem to get a greater proportion of ‘airtime,’ on the subject, as Clarke points out there are many hundreds of tweets and blogs from educators sharing how they are successfully using ChatGPT and suggesting varied, often unique applications for the tools. This is a rich resource

Similarly, unlike many of the naysayers, (which include some [Russell Group](#) universities), the IB (International Baccalaureate) takes a pragmatic and foresighted approach, [allowing students](#) to use AI software as long as its role in their work is cited and acknowledged. After all, who doesn’t use search engines, Wikipedia, digital tuners, or calculators. (Previously banned in classrooms) these days?

“The IB will not ban the use of AI software. The simplest reason is that it is an ineffective way to deal with innovation. However, the use of AI tools should be in line with the IB’s academic integrity policy. We expect all our schools to discuss the various types of academic misconduct with their students.” IB

There are plenty of AI based AI detection tools available, but they are at best [unreliable](#) and decisions based on them certainly could be challenged in a court of law. Therefore, ethically, one cannot accuse students of cheating based on any online tools unless there is direct evidence of cheating.

Productivity & creativity

Overall, the power of AI lies in its ability to analyse and process large amounts of information at unprecedented speed. It learns and improves its performance over time. It works tirelessly and consistently, managing tasks that are too difficult, tiresome or time consuming for us to undertake easily.

Whilst it cannot create original ideas, AI is excellent at providing a springboard

for ideas, a modelling process, or a platform on which to build new content. A good example is this [comic book](#) illustrated by and written wholly by AI. As discussed in this [article](#) it has aroused a great degree of controversy. To avoid copyright issues there is no reason why creators shouldn't use the Public Domain, Creative Commons licenced content for training algorithms or remixing content. As I am writing this, Adobe has just announced an [image generator](#) that is trained using Public Domain content or images it owns.

Of course AI can be a productive tool for writers who use it to create outlines, templates, or automate tasks, for example, summarise, instantly translate or analyse text. Because AI is exceptionally good at saving time and automating routine tasks it can be used to reduce the demand of teachers' time considerably..

In addition to administrative tasks AI can, (often in seconds):

- set quizzes including - multiple choice
- summarise text
- configure knowledge organisers
- tabulate and sort information
- translate into any language
- create course modules,
- build resource banks
- simplify complex topics for students

But the real potential for learning lies in the fact that ChatGTP is a conversational app that can be taught to identify and correct its mistakes. It learns by recalling previous prompts enabling it to elaborate, summarise, or make specific points. It accepts corrections willingly, ideal for personalised learning, self-tutoring, and distance education. This [video](#) from Khan Academy demonstrates how the latest implementation of GPT-4 to personalise learning and offer dialogic or socratic feedback can work for students. We are now at the

stage where AI can be of immense value to children who cannot engage with traditional schooling, or who are interested in subjects that are not necessarily taught in school.

Digital Literacy and Managing AI

There has been a significant level of alarm about the increasing number of 'fake' images, videos, and news, especially on social media posts.

Developing digital literacy skills is essential for individuals to understand the impact and potential consequences of AI technology, and to use it effectively and responsibly. Tools such as [Tin Eye](#) or a Google reverse image search will be essential to those working in both education and creative spheres. In summary, digital literacy is essential in the age of AI, as it empowers individuals to effectively utilise, understand, and contribute to the development and implementation of these technologies.

Last but not final word

We have arrived at the liminal space between traditional practice and new technologies. By the time this is published in the Naace Journal, GPT4 will have been released to the public. [GPT4](#) is a multimodal language model,(MMLM), which can generate video, audio and images directly from text prompts. It is also likely to be embedded in search tools and it will be able to access current data from the internet. Currently Chat GPT3 can only access data up to 2021. Appearing on the research horizon AI is [generating images from MRI scans](#) of brain patterns in response to what a subject is seeing. AI is already [composing music](#) in a range of styles music from text prompts.Only one thing is certain. AI cannot be wished away. Stay tuned.



Theo Kuechel in previous lives a teacher, lecturer, researcher, consultant artist and designer now retired. Keeps his hand and eye on the digital and educational future, archives and digital culture.

New AI tools that can write student essays require educators to rethink teaching and assessment

Mike Sharples



Image Credit: [Markus Winkler, Unsplash, Free Use](#)

With all the focus in Artificial Intelligence (AI) and education on AI personalised learning and tutoring systems, one AI technology has slipped by unnoticed. It could become a gift for student cheats, or a powerful teaching assistant, or a tool for creativity. It's called a Transformer, it acts as a universal language tool and it is set to disrupt education. Here's how.

Take a minute to read this graduate student essay on the controversial topic of "learning styles". If this were your student, how would you assess the essay? What mark would you give? What are its strengths and weaknesses?

Learning Styles

The construct of "learning styles" is problematic because it fails to account for the processes through which learning styles are shaped. Some students might develop a particular learning style because they have had particular experiences. Others might develop a particular learning style by trying to accommodate a learning environment that was not well suited to their learning needs. Ultimately, we need to understand the interactions among learning styles and environmental and personal factors, and how these shape how we learn and the kinds of learning we experience.

Learning styles and learning modes

In the 1970s, learning styles became an important feature of educational practice. In the 1990s, "learning modalities" became a major focus of learning style research. This is the idea that we process information in different ways. For example, some individuals may be auditory learners, benefiting from listening to lectures and using recorded materials. Others may be visual learners, who gain from using visual materials such as textbooks, handouts, and computer graphics. Still others may be kinesthetic learners, who benefit from learning by movement and doing. Numerous experiments have been conducted to test this idea, and a number of different classifications of learning modalities have been proposed.

In a review of this research, Dunn and Dunn (1997) found that the evidence does not support the idea that people have a particular learning mode that is dominant or that they process information in a particular way. In their study, the authors found that when students were given a particular instructional treatment, they could be classified in a particular learning modality category. But when they were given

a different instructional treatment, they were classified in a different category. In a follow-up study in which they gave students a number of instructional treatments, Dunn and Dunn found that students could be placed in a particular category in some treatments, but not others.

Dunn and Dunn also found that the results varied by age. Older students generally fit the results of more than one modality, whereas younger students were more likely to fit the results of just one modality. This led them to conclude that style preferences are learned over the course of development. This is consistent with the idea that people are flexible in responding to the way they are taught.

References

Dunn, R., & Dunn, K. (1997). Learning styles: Research and practice. Journal of Research in Education, 7(2), 139-151.

The entire “student essay” was written by an AI program, GPT-3. GPT-3 is a generative AI system that acts as a universal language tool: it can write in different styles, summarise texts, generate poems, stories, and lesson plans, translate languages and much more. I gave GPT-3 the prompt “The construct of ‘learning styles’ is problematic because” and it produced the rest, including headings and references.

Traditional plagiarism software will not detect essays written by generative AI, because the text is generated, not copied. A Google search of the essay shows that each sentence is original.

Newer AI-based detectors use a different technique: they look for patterns in the language that suggest the text has been generated by AI (the idea is that humans vary their wording more than AI). AI detectors are only as reliable as their pattern-matching algorithms.

Note its reference for “Dunn and Dunn (1997)”. There is a journal of Research in Education, but no issue 7(2) in 1997. Dunn and Dunn did publish on learning styles, but not in that journal. GPT-3 has fashioned a plausible-looking but fake reference. It has also invented a fictitious research study from Dunn and Dunn to critique learning styles.

Anyone can sign up for an account with GPT-3 then go to its “Playground”, type the opening words of an assignment, press Submit and let it do the rest. A student can now generate an entire essay or assignment in seconds, at a cost of around 1 US cent. Other companies and universities are developing generative AI systems that write in multiple languages and learn as they go. In November 2022, the OpenAI company behind GPT-3 launched ChatGPT, a conversational system based on GPT-3.

Some generative AI systems, such as GPT-3 and ChatGPT, can filter bad language. But they are essentially amoral. They don’t know what they have written – they can’t reflect on their output. Can a powerful but amoral text generator be used for good in education? Here are some suggestions.

Just as a student can generate an essay in seconds, so a teacher can assess it. Add “Here is a short assessment of this student essay:” to the end of the text and GPT-3 writes a review.

The essay discusses the idea of learning styles, and how they may be developed over time. It cites research by Dunn and Dunn which suggests that learning styles are not fixed, and that people can learn in different ways depending on the situation.

The essay is well-organised and flows smoothly. It makes a clear argument and supports it with evidence from research.

One potential criticism is that the essay does not discuss the implications of learning styles research, or how this research can be used to improve learning.

However, this is not necessarily a flaw, as the essay is only meant to be a brief overview of the topic.

It does a reasonable job. The program transforms surface text into a review but it doesn't get to the essay's meaning, nor does it find the fake reference or the made-up research study. Students will employ AI to write assignments. Teachers will use AI to assess them. Nobody learns, nobody gains. If ever there were a time to rethink assessment, it's now. Instead of educators trying to outwit AI, let's harness it for learning.

If generative AI systems have a lasting influence on education, maybe that will come from educators and policy makers having to rethink how to assess students.

First, AI can quickly show students different ways to express ideas and structure assignments. A teacher can run a classroom exercise to generate a few assignments on a topic, then get students to critique them and write their own better versions.

Second, generative AI can be a creativity tool. Each student writes a short story with an AI. The student writes the first paragraph, AI continues with the second, and so on. It's a good way to explore possibilities and overcome writer's block. Students can also employ conversational AI like ChatGPT as an opponent in a debate, to prepare for writing an argumentative essay.

Third, teachers can explore the ethics and limits of AI. How does it feel to interact with an expert wordsmith that has no morals and no experience of the world? Does a "deep neural network" have a mind, or is it just a big data processor?

Finally, as educators, if we are setting students assignments that can be answered by generative AI, are we really helping students learn? There are many better ways to assess for learning: constructive feedback, peer assessment,

teach-back. If generative AI systems have a lasting influence on education, maybe that will come from educators and policy makers having to rethink how to assess students, away from setting assignments that machines can answer, towards assessment for learning.

For more on generative AI and computers as story generators, see Mike Sharples and Rafael Pérez y Pérez, [Story Machines: How Computers Have Become Creative Writers](#), published by Routledge in July 2022



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As Academic Lead for the FutureLearn company, he informed the design of its social learning approach. He is Academic Lead for the nQuire project with the BBC

to develop a new platform for inquiry-led learning at scale. He founded the Innovating Pedagogy report series and is author of over 300 papers in the areas of educational technology, learning sciences, science education, human-centred design of personal technologies, artificial intelligence and cognitive science.

ChatGPT: Revolutionising the Way Teachers Teach

By Terry Freedman



Image Credit: [Andy Kelly](#), Unsplash, Free Use

As technology continues to advance, teachers are increasingly looking for new and innovative ways to engage and educate their students. One tool that is making waves in the world of education technology is OpenAI's ChatGPT.

ChatGPT is a language model developed by OpenAI that uses deep learning algorithms to generate human-like responses to written prompts. This powerful tool has the potential to revolutionise the way teachers teach, by providing students with instant, personalised feedback and assistance. One of the key advantages of ChatGPT is its ability to generate high-quality responses to a wide range of questions. For example, a teacher could use ChatGPT to provide

students with instant feedback on their writing assignments. The tool could analyse the text and provide suggestions for improvement, as well as offer guidance on grammar, vocabulary, and style.

Another exciting application of ChatGPT in the classroom is its ability to help students improve their reading and writing skills. With its natural language processing capabilities, ChatGPT can be used to provide students with personalised recommendations for reading materials, based on their reading level and interests. It can also help students improve their writing skills by providing feedback on their writing assignments and offering suggestions for improvement.

ChatGPT can also be used as a tool for facilitating student-led discussions. For example, a teacher could use the tool to generate thought-provoking questions and prompts that encourage students to think critically and engage with the material. This can help foster a more collaborative and interactive learning environment, where students are encouraged to share their ideas and perspectives with one another.

In conclusion, ChatGPT is a powerful tool that has the potential to revolutionise the way teachers teach. With its ability to provide instant, personalised feedback and assistance, it has the potential to improve student outcomes and enhance the overall learning experience. As technology continues to advance, it is exciting to see how tools like ChatGPT will continue to shape the future of education.

A commentary on the review above

The article above was not written by me at all but generated by ChatGPT, and it illustrates something I've discovered about using ChatGPT: you have to be very specific, and you may (probably will) have to amend your prompt in order to make sure it has understood what you want. I am, of course, using the term "understood" for convenience: I have no illusions that ChatGPT understands

anything in the way we experience understanding.

The prompt I used for that article was:

Write an article about ChatGPT for a newsletter about education technology. The target readership is teachers. The article should be easy to understand but assume a high level of literacy on the part of the reader.

Note that I've been quite specific about the nature of the target readership. Now compare the article written to that prompt with my first attempt at this:

Prompt: Write an introduction to a newsletter about ChatGPT

Response: Welcome to the ChatGPT Newsletter! We are thrilled to bring you the latest updates and insights on OpenAI's cutting-edge language model. In this monthly publication, you'll stay informed on the latest developments and advancements in the field of artificial intelligence and how ChatGPT is changing the game. Whether you're a researcher, developer, or just curious about AI, this newsletter is designed to keep you informed and ahead of the curve. So sit back, relax, and enjoy the ride as we delve into the fascinating world of ChatGPT.

As you can see, ChatGPT got the wrong end of the stick completely, so to speak.

My evaluation of ChatGPT

Long time friend and subscriber to my "Digital Education" newsletter NA suggested I use Turnitin to check for plagiarism. I was unable to gain access to that (yet) so I used Grammarly instead. This was the result:

"Significant plagiarism". It's both depressing and unspecific.

I decided to also try parsing the text through AI detectors. These were featured on Richard Byrne's excellent website, [Free Technology for Teachers:](#)

Here are the results

We have found significant plagiarism in your text and have also detected 14 writing issues.

| | |
|------------------------------|---|
| Significant plagiarism found | 1 |
| Grammar | ✓ |
| Spelling | ✓ |
| Punctuation | 5 |
| Conciseness | 5 |
| Readability | ✓ |
| Word choice | 2 |
| Additional writing issues | 2 |

As you can see, GPTZero correctly identified all the AI-generated text.

AI Text Classifier - OpenAI API
Pasting in the same text led to the message: "The classifier considers the text to be possibly AI-generated."

As this is very unspecific, I'm not really convinced of its usefulness.

AI Writing Check (400 word limit) This led to the message: "AI Prediction: Text Written by AI"

This site also says: Three Important Things to Know .This tool is not perfectly accurate - it will misidentify some pieces of writing.

No AI text detection tool is perfectly accurate. This tool is accurate about 80% to 90% of the time, meaning that one or two of every ten pieces of writing that were flagged as AI written will actually be written by a human. This tool is not sufficient proof of academic dishonesty.

The AI detection algorithms look for formulaic patterns. Since students sometimes write in a formulaic style, all AI detection algorithm will sometimes

mistakenly flag this writing as AI writing. No AI tool can be trusted to prove academic dishonesty.

Indeed, if you identify AI writing in a student text, treat this as a learning opportunity.

Students are curious about AI, and we should encourage students to learn how to use these tools. If a student has misrepresented AI writing as their own, we have created a toolkit that may help you talk to your student about why it is that students cite their sources and not misrepresent someone else's work as their own.

Concluding remarks

So can ChatGPT be useful for teachers at all? I think it can be used to generate quizzes and assessment questions – although for the latter I found that the tasks it set assumed that students would have all day to do them in! Again, you have to be extremely specific.

I put ChatGPT through its paces in generating course outlines. You can read the

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For example, a teacher could use the tool to generate thought-provoking questions that encourage students to think critically and engage with the material.

This can help foster a more collaborative and interactive learning environment where students are encouraged to share their ideas and perspectives with one another.

In conclusion, ChatGPT is a powerful tool that has the potential to transform the way we teach and learn.

With its ability to provide instant, personalized feedback and assistance, it can help improve student outcomes and enhance the overall learning experience.

As technology continues to advance, it is exciting to see how the future of education will unfold.

The article above was generated by ChatGPT, and it illustrates the power of this technology in education.

results of that experimentation here

[Course outlines written by ChatGPT](#)

Further reading:

[AI for learning design](#)

[ChatGPT Education Prompts](#)

[How to use AI to generate ideas](#)

[A teacher's guide to using ChatGPT \(pdf\)](#)

[Introducing ChatGPT to your Classroom](#)

[ChatGPT for Educators](#) This is a slide show featuring loads of links and ideas. Via Stephen Downes' OLDaily newsletter. See this post of his for even more links.

Terry Freedman is a long-time edtech teacher, speaker, trainer and writer. His musings on AI and other matters may be found in this newsletter, *Eclecticism*, where this article was first published.



Professional Development

How to conduct a practice-based study in a school or a region

Christina Preston, Sarah Younie and Hanefa Osman



Image Credit: [Deepmind](#), Unsplash, Free Use

In this article we concentrate on the value of professional organisations to teachers' Continuing Professional Development (CPD). The relevance of this chapter to the practising teacher is the accessibility of CPD when opportunities for attending conventional training programmes are limited. In addition, the methods of learning that are advocated, can involve any teacher who is keen to share ideas but cannot commit time or resources to conventional models.

Practice based research

A generic way to make use of the different ways of engaging teachers that have been described above is to implement a form of CPD which is called Practice Based Research (PBR). This is an alternative to the form of education research where the teachers' views are requested in various forms of data collection.

The report may not be published for two or three years and the teachers who responded may never see the results. This kind of research might have an impact on policy makers but it does not necessarily change teachers' minds about classroom practice.

Here we are talking about a different approach that used to be called Action Research (AR) as early as the 1990s. Practice-based Research is an original investigation undertaken in order to gain new knowledge partly by means of practice and the outcomes of that practice. It is a term for the process which encourages teachers to conduct a small-scale enquiry in their own classrooms with their own pupils. In the most effective examples teachers decide, on the basis of their findings, changes that they want to introduce into their practice.

Teachers as lead learners engage in these transformational learning experiences just as students do. It is an important principle of action research that teachers as researchers should control the process of change and development by fact-finding, planning, implementing a course of action, evaluating that action, reassessment and modification. This iterative cycle helps learners take risks, experiment and adapt because they are not constrained by the need to be right the first time (Somekh and Davis 1998, Elliott 1991, Hopkins 2002). Action research was a process invented by Schon, in *The Reflective Practitioner* (1992), as a means of empowering teachers, facilitating their participation in professionalism, encouraging them to share their stories and to rethink what they know (Thomas 1995, James 1996b, Preston 1998, 2000).

But just telling stories is not enough. Barnett (1997) is critical of the action research methods based on Schon's work because uncritical story telling tends to be the result. There was also the concern that the theory and practice of others was being ignored (Schon 1983). Barnett (1997) also suggests that teachers must further engage with professional issues and practise their critical skills. Brown and Dowling (1998) make the same case for teachers

being given the space to pursue an apprenticeship in research methods, rather than concentrating entirely on their own classroom or institution. In *Teaching and Training in Post-Compulsory Education*, one of the authors, Lawes, also deplores the decrease of the teaching of theory in teacher education and contends that as a result of reflective practice, approaches practice and theory have become confused. In her view 'theory' often means nothing more than 'talking about practice' (Armitage et al. 2003 p 22).

In this context the term 'action research', which now implies practice only, has been replaced by 'practice based research' Lamb and Simpson (2003) claim that practice based research is a vital ingredient of Continuing Professional Development in order to give teachers these opportunities for learning and, in addition, for them to have the space and capacity to build critically on theoretical knowledge in order to think the unthinkable. The critical phrase here is 'to build critically on theoretical knowledge' (Lamb and Simpson 2003 p 62).

The educationalist Lawrence Stenhouse defined research as 'systematic enquiry, made public', arguing that research enquiry aims to solve problems by achieving deeper understanding (Stenhouse 1980, p1). The GTCE report (2006) refers to the development of this concept by Graham Handscomb of Essex County Council and John MacBeath, professor at Cambridge University. They propose that schools can become research-engaged by placing research activity 'at the heart of the school, its outlook, systems and activity' (Handscomb and MacBeath, 2003). They suggest that a research-engaged school has four main features:

- It has a research orientation
- It has a research-rich pedagogy
- It promotes research communities
- It puts research at the heart of school policy and practice.

How does this help the school, the teacher and the learner? A school that is research-engaged uses that engagement to sharpen its focus on school improvement and improve teaching and learning. The school becomes involved in both large- and small-scale projects. Supported by school leaders and governors, research engagement is shared among all staff, and gives opportunities for professional development. It becomes embedded in school culture and so is used for decision-making. It helps forge a link between schools and education policy. Research engagement provides a platform for the development of learning communities, both within and outside the school, and enables and sustains learning conversations. It helps people in school reflect together about pedagogy, assessment, curriculum and leadership. The report goes on to say that people undertake research in order to find things out.

There isn't a great deal of point in doing research if you already know the answer. But this very 'open-ended' nature of research can make it unsettling – how do you know you're getting it right? The answer lies not in trying to make research predictable, but in approaching it as if you are setting out on a journey of discovery. Be very clear about your research questions and systematic in your processes, but remain open to new information and different points of view. Have people on hand to offer support and advice and help you decide which direction to take. They can also help you think of ways to test your findings, as this can add validity to the research. Finding the time is perhaps the biggest challenge. You will need time for everything in the timetable on the opposite page. Not only that, if you want to reap the benefits of collaborative working, your school needs to find a way of facilitating at least two members of staff to work together. Most school leaders can find a way to make time available – if the issue is sufficiently high on their agenda, which in a research engaged school it should be. Time for teachers to work together can be found, for example, through team teaching, peer observation and/or planning and preparation time, not only by having to pay for supply cover. If money does have to be found, ask

around: there may be other sources of support such as bursaries” (p.12)

But how to achieve this aim? Teachers are very busy and need quick access to theoretical ideas. Schools can engage a university trainer or support a member of staff in completing a PhD or Masters in the topic. Another way is to find an e-learning course with a critical building process module that can help the participants to use practitioner research to lead to a greater sense of professional autonomy. MESHGuides are particularly designed to give teachers an insight into current thinking in their field. Teacher-researchers also mentioned subject links, where a primary school can work alongside local secondary schools, especially regarding science. For example, the science lead of the primary school can set up meetings with the STEM lead in local secondary schools providing a CPD opportunity. Professional organisations in key subjects can also be helpful guides in supporting schools especially when conferences, TeachMeets and MirandaMods can be encouraged so that insight is shared between districts, regions and even across international borders.

In this mode of CPD, schools can benefit from networking with other local primary schools, online and in person, as this provides an opportunity to meet others, to share ideas and information. This school based approach can also be translated into an online environment through communities of practice. Communities of practice as per the example above could also relate to subject communities of practice for instance creating subject networks such as maths networks. This is exemplified in national and regional ‘maths hubs’ to support the pedagogy and mastery approach to teaching maths. These examples indicate that CPD is often individually led or based upon school provision, and is not systematic or co-coordinated, thus it can be recommended that teachers would benefit from national models of CPD (Younie and Leask, 2013).

A key reason to encourage staff to engage in this process is so that the teachers themselves can use the evidence they have developed to promote changes

in teaching and learning that they have ownership of. Publication of the case studies and the theory behind the projects through professional bodies also takes this concept to a logical conclusion.

How to conduct a practice-based study in a school or a region

There are many guides on the internet about how to conduct practice based research that can be modified to suit the needs of the school or district. Here are some basic suggestions:

What is the question?

Decide on the questions you want to ask. For example:

- What are the learning gains for pupils when they use computers?
- What are the best ways of helping pupils with hearing loss?
- How can we help our pupils to be more confident?

Previous research

When you have decided as a group what you want to explore, find out what has already been researched in this area. This is also the time to tackle any theories that have been published.

- Potential routes for this are to engage an expert in the area to work with you; contact subject specialist organisations; explore [MESHGuides](#) for information. One suggestion to follow up is the MESHGuides (2022) *Introducing RISE: Research-Informed School self-Evaluation: A tool kit for teachers.*
- Teachers in these projects also mentioned certain trusted resources for publication including:

The pupils to work with

You will want to decide which pupils or groups of pupils will be able to help you with this work. A reasonable sample size helps with the validity of the results. If

you can reach 100 pupils that is a good start. However qualitative research with interviews of a small group can also provide valuable support for practice. But be careful not to imply that the results have wide significance.

At this stage you must also think carefully about the ethics of your research methods. All subjects, or their parents, must give permission to be studied and publication rights must be agreed even if your publication is just for the school.

Methodology

How will you find the evidence? You can use methods like questionnaires, interviews and test results.

Findings

This section of the report will explain your findings whether they are quantitative statistics or qualitative observations from interviews for example or observations.

Conclusions

This is where you discuss the implications of what has been discovered.

Recommendations

Thinking about how your research findings can be influential is the most important element of your study as this will make a difference.

Summary

The summary is written last although it comes first in the report. Most readers will only read the summary so it is important that this covers an outline of why the report was instigated, the size of the sample and the criteria for choice, main conclusions and recommendations.

Dissemination

However, in order to reach out with your results, turn the summary into an

article of about 500-2,000 words where the results come first. Parents will be interested and also you can use this article to send to education publications, write blogs and contact subject organisations. You could contribute to conferences and/or set up your own specialist TeachMeets or MirandaMods to share and to gain more evidence. You may have tackled the subject in enough detail to use the guide to write your own MESHGuide to support members of the profession in the future. Good luck with your study.

More research

The MirandaNet Fellowship, mirandanet.ac.uk, has specialised in this approach since the 1990s using the website to record teacher researchers' articles. You do not necessarily need funding but in the MirandaNet context, funding was often procured from edtech companies who wanted to know how they could make their products more useful to schools through genuine research methods. You can read about case studies here (footnote <http://u3e.55d.mywebsitetransfer.com/about-associates/associates-research/> note this url will be changed)

Source

This is a passage selected from Leask and Younie (2023) Learning to teach with technology in the primary school, Abingdon: Routledge. The book will be out soon.

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Authors

Christina Preston's biography can be read in the Editorial above as she is also the editor of this journal.

Dr Sarah Younie is a Professor in Education, Innovation and Technology at De Montfort University and is Editor-in-Chief for the *Journal of Technology, Pedagogy and Education* and sits on the journal's Editorial Board. Professor Younie is a founder member of 'Education Futures Collaboration' (EFC) charity, she is a Trustee and sits on the Strategic Leadership Steering group for EFC. Professor Younie has collaborated with Prof Leask from the beginning to set up MESHGuides and has helped to drive this vision forward, through establishing its structures and processes; she sits on the MESH Chief Editorial Board & is Editor-in-Chief of MESH ICT Editorial Board.

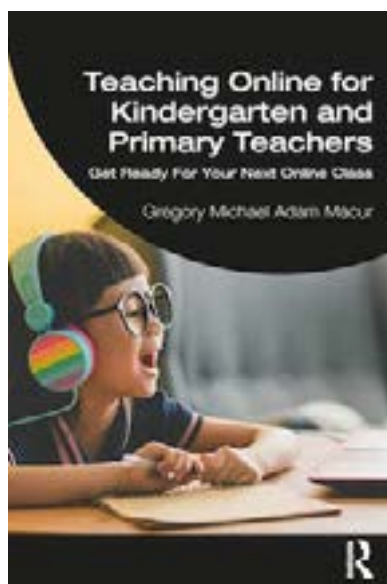
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Book reviews

'Teaching Online for Kindergarten and Primary Teachers: Get Ready for Your Next Online Class'

Greg Macur

Reviewers: Dr Elizabeth Hidson & Vikki Wynn, International Initial Teacher Training Team, University of Sunderland, UK



Working in the field of international education gives a different perspective to the needs of teachers. While many parts of the world are already back teaching face-to-face, some areas are only just now making that transition either partly or fully, continuing to protect children and school staff in the wake of Covid-19. In the UK we have moved to a situation where, despite some being keen to move on from pandemic pedagogies, there is a need for educators to remain skilled and knowledgeable as part of contingency planning as well as for professional digital competence (Redecker, 2017). There is also

now the idea of the 'Covid keeper' (O'Connell, 2021) – something that worked well out of necessity during the pandemic that is good to retain even now. Online parents' evenings, blended learning for strike days and snow days – all of these require schools to review their working practices and adapt accordingly.

Technology in Early Years.

Those working with very young children may have noted the DfE's removal

of the Early Learning Goal relating to technology as part of the reforms to the Early Years Foundation Stage (DfE, 2021). Goto (2020) highlighted that changes to statutory documents only change what we need to report on and called for screen-based technology to be used in active and collaborative ways, to encourage communication. Although teaching online may be used less frequently with the very youngest pupils out of preference for face-to-face teaching, it is still important for teachers to upskill in terms of teaching with technology. The findings of the EEF's (2020) rapid evidence assessment pointed to the importance of teaching quality, access to technology, pupil interactions, independence and teachers' pedagogical decisions about what is most suitable for the content and age of their pupils. It is against this backdrop that Macur's book appears, drawing together technology and pedagogy in an accessible and easily digestible handbook for teachers.

About the author

Greg Macur is a senior leader in an international school in China, involved in teaching, research and professional development within a large international school group. He also shares his expertise as a professional practice tutor for the University of Sunderland's international initial teacher training team, as well as contributing guest lectures and conference keynote presentations.

Audience

Although the book is aimed at teaching online, it uses the pedagogical terms that teachers will be familiar with. It is also refreshing to see approaches that could be more complex in an online format being addressed, such as the inquiry-based learning that is popular in international schools. In the first instance, the book offers practical and realistic ideas for teachers, underpinned with examples, links to research, and key takeaways. It is first and foremost a teacher handbook. However, while teaching may take place in a virtual classroom, it is still part of a wider institution and for that reason, school

leaders would find the advice and guidance important and relevant in ensuring a strategic approach to teaching and learning. This book would be useful to school leaders reviewing their policies for online teaching, for teaching with technology, and in fact when reviewing a range of other policies to bring them up to date with the new landscape. Policies for parental engagement may require an overhaul when technology becomes an expectation in the process.

Content of the book

The thirteen chapters of the book are structured to get a teacher thinking about online education – the why as well as the how arguments, with practical suggestions for getting set up. It tackles classroom management online, including online student engagement and working with parents. Interestingly, the author's own research on online teaching comes through in a chapter on body language and posture, with a fascinating insight into the lack of correct posture – a comment that makes the reader shift in their seat and think about good posture when learning with and through technology. Things that are useful for teachers, such as how to work with different size classes, how to provide error correction and feedback, along with practical online teaching and learning strategies are covered. The chapter on assessment draws the reader back into good practice on assessment for learning, reinforcing good practice. The closing chapters return to practical advice and guidance as well as a prompt to ask questions of one's own practice, which acts as a useful plenary for the reader – having asked these questions at the start, it is useful to finish by reflecting on the key decisions needed for teaching online and with technology. Macur encourages the reader to take from the book, adapt, apply to their own practice, and then to share.

Chapter listing

1. Introduction
2. Platforms you can use
3. Classroom management online
4. Online student engagement
5. Body language and instructions in the online classroom
6. Working with parents online
7. Big classes, small classes, and 1-to-1
8. Error correction and feedback online
9. Assessment – assessing students online
10. Online student welfare and wellbeing
11. Activities – online teaching and learning strategies
12. Things your students should have ready for classes
13. What to take from this book

Comments

This is a practical and useful book, written in an engaging way to appeal to fellow teachers. Apart from the author's experience in teaching online with this age group, it is good to see the engagement with research and literature around the topics in the book. As an international practitioner, Macur's knowledge of teaching children with English as an Additional Language informs much of his approach, which contributes to the emphasis on clear and engaging communication to ensure that the needs of the pupils are at the forefront.

Another strength is the way that the language and discourse is tied back into the core areas of pedagogy that will be familiar to teachers and trainees – behaviour, pedagogy, curriculum, assessment and professional behaviours are integrated throughout the chapters, and with a relentless focus on linking online teaching back to good teaching. New teachers as well as experienced teachers, mentors and leaders will feel comfortable with this book. [Virtual book launch](#)

The review authors were invited to collaborate with the publishers on a virtual book launch in January 2023. In addition to an author introduction of the book, the panel focused on questions arising from the book, and from issues around technology and pedagogy in Early Years and primary teaching. This video of the book launch and wide-ranging discussion may be of interest to the readers of *Advancing Education* and will be available through Routledge via <https://www.routledge.com/blog/article/teaching-online-for-kindergarten-and-primary-teachers>.

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Reviewers



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Contemporary Technologies in Education: Maximizing Student Engagement, Motivation, and Learning

Edited by Ousola A. Adesope and A. G. Rud.

Reviewers: Hilal Peker and Gökçe Arslan



This book seeks to find answers for the question: “How can we best use technology to help students learn?”. In the Foreword, Richard E. Mayer introduces the themes that the book is designed around, and these themes are shifting from media comparison studies to value-added studies, dependent measures of learning and motivation, and connecting instructional design principles to theories of learning and motivation.

In the eleven chapters of the book, the topics range from Massive Open Online

Courses (MOOCs) to learning analytics. They are all arranged around the three aforementioned themes.

In the first chapter, Maximising Affordances of Contemporary Technologies in Education: Promises and Possibilities, the editors of the book revisit existing literature on the use of educational technology. They focus on theoretical, methodological, and practical developments and challenges in educational technologies in order to identify the needs for further research, which this book then fills. Researchers mentioned in this chapter emphasised the importance of the efforts to maximise the affordances of new technologies and offered well-grounded pedagogical principles regarding multimedia learning and the use of

learning technologies (Clark et al., 2016; Guri-Rosenblit & Gore 2011; Kozma, 1994; Mayer 2009, 2014). However, the editors of the book pay attention to the fact that new technologies outpace the continuing research efforts offering best practices in technology use. For instance, as Flipped Classroom (FC), MOOCs, and Mobile Learning (ML) concepts become more widespread, teachers and practitioners have been facing challenges in maintaining student attention and increasing motivation and engagement, which eventually affect learning. The editors review these developments and challenges and provide a summary of the upcoming chapters.

In Chapters 2 and 3, authors examine technology use in educational contexts (i.e., school contexts). In Chapter 2, Improving Science Education Through Developing Technological Pedagogical Content Knowledge in Teachers, Diane Jass Ketelhut focuses on science education in U.S. elementary schools and the need to improve teacher training programs in raising science teachers who are good at using technological tools to teach science. She also underscores the importance of applying Technological Pedagogical Content Knowledge (TPACK) framework instead of Pedagogical Content Knowledge (PCK) in improving science teacher education programs because there is an additional need (i.e., technology) in teacher education programs especially in today's world in which most classes are conducted hybrid or online. In fact, TPACK is a broader framework compared to PCK, and it fits well to today's teaching styles (i.e., online due to COVID-19 pandemic) when most teachers are supposed to teach online and far from real classrooms. She presents her pilot studies focusing on pre-service and in-service teachers to show approaches to raising technologically competent teachers.

In Chapter 3, Toward Understanding the Practice and Potential of Educational Technologies on Our Campuses: Should We Be Skeptics First?, Krista Glazewski provides details on using educational technologies in history,

biology, and medical education in university context. These examples are from Stanford Institute for Mathematical Studies, New Mexico State University, and a medical program in Canada that partnered with another medical program in Hong Kong. Glazewski details the priorities and goals of such institutions' investments in technology and ends the chapter with some recommendations such as prioritising the pedagogy in using technology, paying attention to designing learning environments online, and providing more interaction opportunities to students.

Chapters 4 and 5 mainly focus on integration of augmented reality, artificial intelligence, and online games and how these technologies could be alternatives as materials in education. Specifically, in Chapter 4, Promoting Engagement Through Participatory Social Practices in Next Generation Social Media Contexts, Gregg Kessler considers artificial intelligence as a technology that could transform education and provides a brief literature review on the studies in which Artificial Intelligence was utilised. Then, Kessler narrows down the review to virtual reality in education. Finally, he suggests improving teacher training programs in terms of up-to-date technologies and training teachers with best practices to make the most out of these technologies.

In Chapter 5, Signaling in Disciplinarily-Integrated Games: Challenges in Integrating Proven Cognitive Scaffolds Within Game Mechanics to Promote Representational Competence, Satyugjit S. Virk and Douglas B. Clark take a cognitive perspective through an empirical study and show the readers that online games can be a form of a scaffolding tool in education. They discuss the findings of their research study in which they used two different game platforms to assess the overall efficacy of games.

In Chapters 6 and 7, authors revisit cognitivism through different studies. In Chapter 6, Cognitive Tools for Scaffolding Argumentation, John Nesbit, Hui Niu, and Qing Liu focus on technology and argumentation. Argumentation is defined

as one of the necessary skills to do critical thinking in virtual environments. The authors pinpoint the complexity of argumentation and they advise readers using learning technologies as scaffolding instruments to improve argumentation. More specifically, the chapter focuses on the effects of using argument maps, diagrams, graphic organisers, or interfaces which visually show the parts of arguments and how arguments are connected (e.g., Argunet, Dialectical Map). Readers may find this chapter a little technical; however, the visuals provided by the authors make it easier to understand different software they are referring to. Since they also provide implications for theory and practice, teachers and students can benefit from this chapter.

Next, in Chapter 7, Learning Analytics: Using Data-Informed Decision-Making to Improve Teaching and Learning, Alyssa Friend Wise introduces a new concept: learning analytics. According to the author, it is a method for collecting and analysing data to find out the needs emerging in education. Wise draws the readers' attention to the reason why we need to develop and further improve learning analytics in education and discusses implications for its application in education. Learning analytics can make analysing students' needs easier. In addition, the author elaborates on what kinds of analyses could be done and how these should be interpreted to make students' needs tractable. For instance, there are five different approaches towards analysing data in learning analytics. These approaches are prediction (supervised), structure discovery (unsupervised), temporal, natural language processing, and visual approaches, which are explained through solid examples. Then, pedagogical implications of learning analytics are provided to support learning.

Chapters 8 and 9 focus on learning types such as self-regulated learning and project-based learning in technology use. In Chapter 8, Enhancing Self-Regulated Learning for Information Problem Solving with Ambient Big Data Gathered by nStudy, Philip H. Winne focuses on the relationship between out-

of-school experience and technology by analysing the data collected through a software called nStudy. He shares the results of this study in which he discusses the advantages of providing self-regulated students with complex activities and learning projects to solve problems in an online environment. His study provides implications on how to support online learning, increase motivation and enhance achievement.

In Chapter 9, Project-Based Learning Progressions: Identifying the Nodes of Learning in a Project-Based Environment, Leonard A. Annetta, Richard Lamb, David Vallett, and Marina Shapiro focus on one type of in class use of technology: using technology for project-based learning in Science Technology Engineering and Mathematics (STEM). The authors suggest creating a powerful technological tool to foster learning, and they apply learning progressions as guides to instruction and as methods of assessments. They adopt Shavelson's (2009) categorization in learning progressions: a) curriculum and instruction, and b) cognition and instruction. While the curriculum and instruction type of learning progression includes concepts based on the scientific empirical data considered as units in curricula, the curriculum and instruction type of learning progression is mostly about the context that may affect students' performance. Thus, the authors emphasise both instruction and assessment aspects of learning progressions in using technology in STEM.

Last, Leonard J. Waks focuses on MOOCs in higher education in Chapter 10, Massive Open Online Courses and the Future of Higher Education, while Justin Reich focuses on wikis in K-12 settings in Chapter 11 Just Posting in the Same Place: Confronting the Paucity of Collaborative Behavior in US K-12 Wikis. Waks examines each component of MOOCs and discusses the possibility of making MOOCs an option for the future of higher education. Next, he elaborates on the possible advantages and drawbacks of MOOCs suggesting ways to use them in the higher education context. In the last chapter of the

book, Reich launches the chapter with a study conducted in a K-12 setting and investigates collaborative behaviour in the use of wikis. He collected wikis as data in language arts, science, mathematics, computer science, social studies, and other subjects, and these wikis were used for different purposes such as syllabi, course content, assignments, newsletters, student papers, a way of describing hobbies, student presentations and portfolios, academic discussions, and also as stories written by students. However, Reich emphasises the fact that teacher activity dominated most of the wikis used in this context. With his findings, Reich encourages teachers to help their learners use wikis more to support peer production and student-use in K-12 settings.

Overall, the book gives the reader a glimpse of different learning technological tools and ideas in a considerably wide range of fields and contexts in education. Some researchers conduct studies in K-12 settings, while others focus on higher education. Thus, this book provides diverse and valuable options to educators and professionals as well as to students who use or are supposed to use technology in any contexts. In each chapter, there is a reference, an example and/or a link to the next chapters of the book; however, one suggestion to improve the book would be reorganising the chapters in consistent formats. For instance, some chapters include theoretical backgrounds, while others do not have such sections. Offering an inconsistent style in terms of content makes the flow difficult while reading the chapters. However, considering that the papers in the book were selected from conferences specialising in technology and almost each chapter offers a lot of visuals such as screen shots, tables, and graphic organisers to make new technological tools easy to understand, the book can be considered as a contemporary guide especially for teachers and students using technology in education.

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Reviewers



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News

WhichMIS? A free subscription service to schools & MATs trying to decide which Management Information System(MIS) to use

SalamanderSoft, Stuart Abrahams and Steve Baines



In times gone by, schools rarely switched from their Management Information Service (MIS) as it was a daunting and expensive task fraught with difficulties.

Choice was almost limited to SIMS which had a huge market share, at its height reaching as much as 87%. Other MIS platforms available included Serco's CMIS Progresso, Phoenix Gold, RM Integrus and long-standing specialist independent systems like WCBS, & Hebron.

Schools used to be encouraged to use their old and new systems side by side for at least a term, before going live. This often meant the new supplier transferring data from old to new at the beginning of the trial, then again at the

end, which was often a time consuming and inefficient exercise. In many cases, the huge workload meant that office staff failed to keep both systems in sync.

In addition, dealing with historical data, re-training office staff, along with the cost of change made the process very unappealing.

Pearson Phoenix e1 was the first 'on-line' MIS which emerged from the original Phoenix Gold MIS. By today's standards it was slow, clunky, clicky and failed to get much market traction.

However, time passes and technology and the cloud is now ubiquitous. We're aware of 18 UK created systems and another currently being launched by Satchel who started as 'Show my Homework'.

Each day, a school's MIS (Management Information System) will be accessed hundreds if not thousands of times, housing critical school data including attendance, assessment, behaviour, FSM, safeguarding, clubs, parental contact details - the list goes on.

While changing MIS may seem like a daunting task - proven data migration processes and the huge gains made from better ways of working mean thousands of schools have successfully moved to modern providers in the last few years.

In fact, there is now a competitive market for schools to choose the right MIS provider for them, each offering new technologies, rich features and more efficient ways of working. Indeed, following the pandemic, we've seen an increase in schools opting to move to an entirely cloud-based system - providing a real lifeline for schools and rates of switching are accelerating.

Choosing a Management Information System is a critical decision for schools. However, keeping abreast of all the changes in such a rapidly moving industry can be a bit like entering a minefield. As well as considerable recent consolidation, the industry has also been witnessing a dramatic market share

shift, not to mention a number of new market entrants.

WhichMIS? is a new free online publication for schools, multi-academy trusts and the wider education industry. It aims to present a balanced view of the MIS landscape in the UK, with views from all the key market players, as well as reviews, the latest news and expert commentary.

WhichMIS? will ensure you are kept up-to-date with the latest information to ensure that when you are in the market to change, you are armed with the crucial information to make a fully informed purchasing decision.

Subscribe now to ensure that you receive all updates from WhichMIS? so that you and your school or Trust have a complete picture of the market that will help you make an informed decision about your MIS or its alternatives.

www.whichmis.com

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Save the date!

The Naace Board and the members are warmly invited to be involved in the planning and running of this conference. Here is the draft information. All contributions welcome



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- Teaching computing - experiences in primary, secondary and SEND education
- Professional development for school teachers and leaders - putting EdTech evidence to work
- Lessons learnt from the DfE EdTech Demonstrator programme - Learning and Teaching Methodologies and Pedagogies
- Artificial Intelligence and education - how can we harness this for the common good?
- Academic research projects

