Our Spring Term edition is once again led by Miles Berry, Professor of Computing Education at the University of Roehampton, with Allen Tsui adding his thought provoking article.

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SAPIENTIA

From ICT for Education

Everything you need to know about Computing, the curriculum, and the classroom.

Welcome to the spring term edition of Sapientia, ICT for Education's exclusive newsletter that provides education professionals with thought leadership, an insight into hot topics, and practical guidance on how to implement new technologies and techniques to improve teaching and learning.

This edition includes a detailed update on the potential and use of generative AI in education, as well as an offer of expert physical Computing and programming workshops for your school.

Miles Berry, Professor of Computing Education at the University of Roehampton, presents an update on generative AI in schools covering government funding, DfE proofs of concept and pilot projects, lesson plans and anonymised pupil work that can be used to augment or fine tune language models, and more. He also touches on work by Oak National Academy to build a comprehensive library of lesson plans and teaching resources.

On a practical basis, Berry suggests that rather than trying to keep up with the latest AI tools and technologies, a pragmatic approach for schools is to develop proficiency with core tools. Helping schools in this direction, he lists some of the tools and their competencies that have recently attracted his attention.

Also, in this issue of Sapientia, Allen Tsui, Subject Lead for Primary Computing at Willow Brook Primary School Academy, considers the provision of physical Computing and programming workshops for teachers and schools. He notes the challenges of funding workshops, as well as the potential of collaboration with other education organisations and commercial companies in the technology sector to deliver a thriving learning environment for schools.

On this basis of challenge and opportunity, Tsui is curating teaching materials and learning resources, including equipment such as micro:bits and Intelino SmartTrains, to continue his offer of workshops to schools that must meet statutory requirements and colleagues who would like to improve their school's capabilities. Read on to find out more and contact Tsui to arrange a workshop at your school.

To keep pace with the changes, challenges and opportunities in the primary and secondary education sectors, register for ICT for Education's termly newsletter here or e.mail il@ictforeducation.co.uk. And don't miss our live ICT for Education events, where you can listen to expert speakers including Miles and Tig and network with colleagues. **Click here** to find out more and register for upcoming ICT for Education events.

Sarah Underwood Editor - ICT for Education

Generative AI and schools - an update

By Professor Miles Berry, Professor of Computing Education at the University of Roehampton.

It's been a while since I wrote for Sapientia about generative AI, although I've been speaking about it at a number of conferences and workshops over the past couple of years. I've particularly enjoyed supporting some schools and trusts on their journey to making effective, efficient and ethical use of these amazing tools. I'd like to use the opportunity of this term's newsletter to bring things up to date.

Policy

Education and wider government policy has evolved considerably. The UK Government has developed a sound set of regulatory principles that apply across the public sector: AI use should be underpinned by safety, security and robustness; by transparency and explainability; by accountability and good governance; and by contestability and redress. For schools or trusts looking to draft their own AI policies, this is as good a list of subject headings as any, and is particularly relevant given Ofsted's role in holding schools to account against these principles.

The DfE is investing in the development of generative AI tools to support teachers and schools. These are focussed more on teacher-facing tools than anything that pupils themselves might use. The department has put £4 million into a trusted content store to pull together curriculum guidance, lesson plans and anonymised pupil work that can be used to augment or fine tune language models. For secondary teachers, it would be great if this also included GCSE and A Level specifications, past papers, mark schemes and examiners reports, but there appear to be some thorny copyright issues here.

Oak National Academy has a comprehensive library of lesson plans and teaching resources. It has used this as the basis for a couple of AI experiments, firstly a generator for multiple choice questions, but more impressively Aila, a lesson plan generator that walks the user through a sequence of questions to tailor its planning and produce editable planning, quizzes and slides. Oak's approach doesn't suit everyone, but I'd encourage readers to try it out – it's free.

DfE is also funding proof of concept and pilot projects, including some work from faculty on providing feedback to teachers and Key Stage 2 pupils on their writing – we should see other subjects and key stage pilots soon. I suspect few pupils will find it as motivating to get feedback

from an AI as knowing that their teacher has read and responded to their work.

Education Secretary Bridget Phillipson opened the BETT show with a generally enthusiastic vision of how AI can support educational aspirations and help with recruitment and retention. Phillipson also announced new training materials for teachers on using AI, and alongside this, we saw significant revisions to the DfE's AI guidance, which is now much more about teachers using AI for low-risk, workload reduction tasks, and taking a more cautious approach to pupils' own use of these tools, making clear that this latter must be inline with providers' terms and conditions and safeguarding requirements.

A few days earlier, Downing Street had announced its AI action plan. This includes upskilling the workforce, with a hint that AI skills will be there alongside digital skills in curriculum changes following the current review. The plan references how South Korea has integrated AI, data and digital literacy into its education pipelines. Closer to home, some of the EU's AI Act provisions came into effect on 2 February, including the requirement that organisations deploying AI ensure that there's training for those using it. The voluntary approach in Britain suggests some divergence from mainland Europe on this already.

Technologies

The technologies move on more quickly than policy, and new products and versions are released every week. Rather than trying to keep up with latest thing, the pragmatic approach for schools is to develop proficiency with the core tools. My advice is that if schools are using Windows and Office, then Copilot is likely to be a good choice; if they are using Chromebooks and Google Apps, then Gemini is likely to work for them.

A few things that have caught my eye recently:

- NotebookLM, from Google, makes retrieval augmented generation, where the language model responds based on one or more uploaded documents, very accessible. It's great at producing knowledge organisers and practice questions when given particular curriculum materials. It's greatest feature is its production of realistic sounding 'podcasts' of two very enthusiastic, knowledgeable presenters discussing whatever content it's been given.
- Brisk is a Chrome extension that will quickly produce AI resources to accompany any webpage you visit. I particularly like it's Boost feature that creates a class set of chatbots for pupils to learn about the content independently. I'm a bit hesitant about the privacy permissions it requests, so take care that your data protection colleagues sign this off before using it in school.
- Custom GPTs and Gems – if you or your school are paying for the plus versions of the tools, you should be able to create your own bespoke version of a chatbot and share access to this with other users of the platform. We've done some work with this at Roehampton, experimenting with bots that give feedback on pupils' programming exercises, feedback, but not grades, on students' draft assignments, and even practice for job interviews.
- LearnLM – Google has taken its Gemini language model and fine tuned this with a particular educational focus. It builds into its chatbots key pedagogic ideas like active learning, managing cognitive load and the importance of motivation and engagement. You can try using this with a free API key in the Google AI studio, although Gemini's 'learning coach' gem now implements these too, at least for those with access to Gemini advanced.

It is fun exploring and experimenting with the latest tools, but I think we should be a little more cautious about rushing to recommend these to pupils, to incorporate them in our teaching or to adopt them at school or trust level. There's still a need for subject and pedagogic knowledge in prompting well, for criticality and discernment in responses, and for wisdom in discerning whether it would be better to do the work for ourselves rather than letting the machines do it for us.

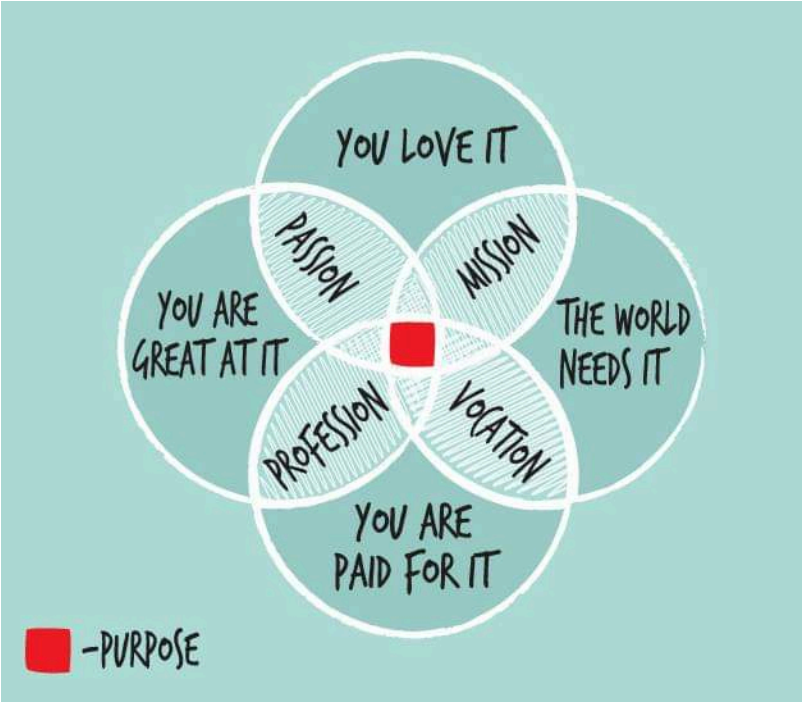
Professor Miles Berry

Miles Berry is Professor of Computing Education at the University of Roehampton. Before joining Roehampton, he spent 18 years in schools, including a period as a head teacher. He has contributed to a wide range of computing projects, including the computing programmes of study in the National Curriculum, Barefoot Computing and Switched On Computing. He serves on the boards of Computing At School, the BCS Academy of Computing, and the National Centre for Computing Education, and is a regular keynote speaker and international consultant on curriculum and professional development. He is @mberry on Twitter and find out more on milesberry.net

What's your why and where next?

By Allen Tsui, Subject Lead for Primary Computing at Willow Brook Primary School Academy

While I was travelling back to London after presenting at the ICT for Education Conference held at Aston Villa's stadium in November 2024, the delegates who attended the event and made time to speak to me in person got me thinking, why do I do what I do? The easy answer is that I have been sharing this Venn diagram since I was nearing the end of my first year as subject specialist in Computing in summer 2021.



This diagram does not explain my experience of the free workshop offer I spoke about during my presentation at the ICT for Education conference. Sadly, the workshop plan for 2024-25 has reduced significantly as the funding stream that enabled the opportunity for me to collaborate with other schools ended in summer 2024.

However, the generosity of the Ogden Trust with its 'time buyout' arrangement, combined with a bursary from the Digital Schoolhouse outreach by UK Interactive Entertainment, that was supported by Nintendo, enabled me to work with 25 schools where I presented workshops connected to the

micro:bit NextGen offer of class sets of 30 micro:bits being donated to primary schools that registered during a giveaway that started in March 2023 and ended in December 2023.

As a result of this generosity, I found myself collaborating with Intelino (see the summer 2024 edition of Sapientia), which led to an opportunity to collaborate with Network Rail as it celebrates the 200th anniversary of the modern railway. #Railway200 plans a ‘classroom in a carriage’ idea that could potentially come to a mainline railway station near you in 2025.

By presenting workshops at so many brilliant schools and meeting colleagues through social media within the Computing and Computer Science teaching community, I concluded that, even without the funding, it should be possible to continue this philanthropic drive to practically advocate for Computing in this way. It is, after all, a roving or touring version of Code Club, which I co-led since 2016 and have led since 2020.

My appearances at the Maker Festivals in May 2024 in Birkenhead and Liverpool in June 2024 confirmed how popular the idea of bringing and sharing my experience of teaching physical Computing and programming would be. However, my experience of trying to establish what I describe as #TwitterTrainTour2025 has hit the buffers – not for financial reasons, but for reasons of time and space.

Libraries and museums have been hit by ‘footfall’ targets and need to ensure activities they host attract the greatest number of visitors possible. As a result, rather than hosting five-hour workshops that could enable those attending to register for the British Science Association CREST Award Discovery Certificate, the preference is for workshops or exhibitions that are shorter and attract more visitors.

So, where next?

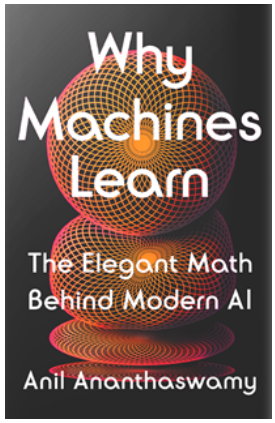
My plan is to make the best use of the teaching materials and learning resources I have curated, including equipment such as Intelino SmartTrains, micro:bits, and acrobatic and dancing robots for penalty shoot-outs, by focusing on schools aligned to the statutory expectations for teaching programming for two reasons. First, to support schools that, for whatever reason are or feel that that they are, unable to meet the statutory expectations for teaching programming. Second is the fishing idiom, to support colleagues who would like to improve their school's capabilities for teaching programming and physical Computing.

For details of how to arrange programming and physical Computing workshops at your school, contact Allen via LinkedIn https://www.linkedin.com/in/allen-tsui-19b61623a/

Allen Tsui is Subject Lead for Primary Computing at Willow Brook Primary School Academy, where he specialise in teaching Computing to children as young as aged 3 (Nursery and Early Years) to 11 year olds (Year 6).

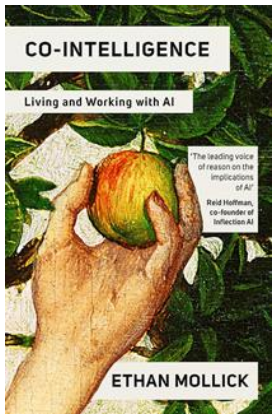
Allen Tsui

Further reading



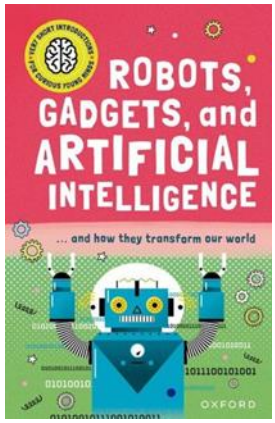
Miles Berry, Professor of Computing Education at the University of Roehampton recommends Ananthaswamy, A. (2024). **"Why Machines Learn":** The Elegant Maths Behind Modern AI. Random House.

This is technical, but not too technical – a great read for those who want to understand the maths



behind the magic. Also Mollick, E. (2024). **"Co-Intelligence"**: Living and Working with AI. WH Allen.

Mollick is a well respected voice on AI, particularly in education, and how we humans can best make use of generative AI by working alongside the chatbots.



Allen Tsui, Subject Lead for Primary Computing at Willow Brook Primary School Academy recommends **“Robots, Gadgets, and Artificial Intelligence”** by Tom Jackson and Dr Vaishak Belle takes a more story telling, narrative approach through the history of technology, making technical ideas tangible and drawing on current concepts to enable readers to form their own ideas for the future.

Allen also suggests **“Simply Artificial Intelligence”** by Hilary Lamb, Joel Levy and Dr Claire Quigley was originally published in 2023 so potentially some of the ideas might have been superseded but nevertheless provides a great starting point for those interested in developing a greater understanding of all that is being said about AI. This book is a great glossary of extremely accessible ideas and concepts which underpin Artificial Intelligence. (Aimed at audience with a reading age 10+)

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Tuesday 23rd September | 10:00 – 12:00

Wednesday 12th March | 10:00 – 11:00

Tuesday 22nd April | 13:00 – 14:00

Thursday 15th May | 16:00 – 17:00

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