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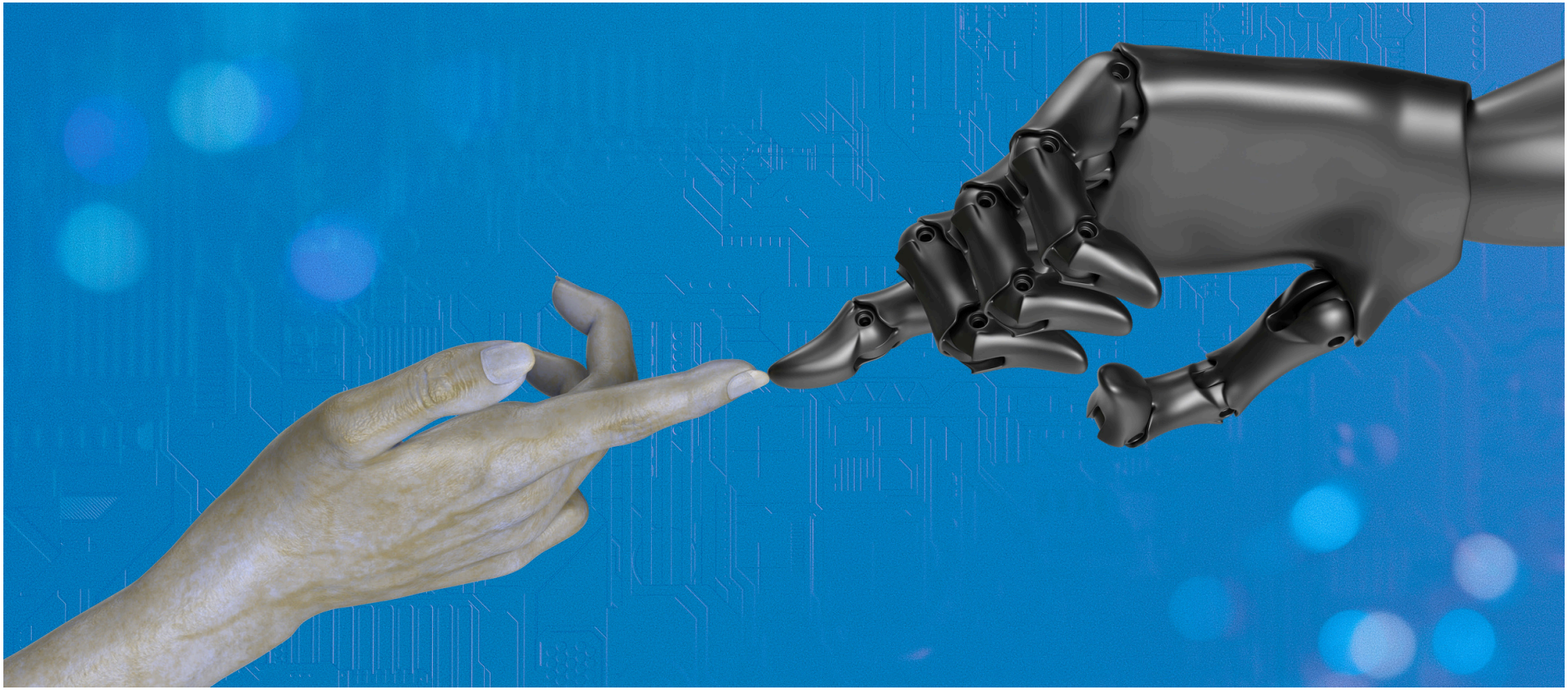

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DIGITAL LEARNING REIMAGINED

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Contents

Editorial

Welcome to the latest edition of *Advancing Education*: 'digital learning reimagined'. This issue brings together a diverse set of contributions that illustrate how creative and thoughtful digital education can be. Our authors describe a sector that is continually reimagining what learning can look like, spanning early years to university classrooms, and covering themes as varied as heritage storytelling, genocide education and AI building learner autonomy.

Two themes thread their way through the collection. The first is 'digital pedagogies across contexts'. Lucy Tidd shows that even the youngest learners can benefit from carefully introduced technologies that are sensitive to developmental needs and real-world constraints. Dr Julian Ayres and Monty Kennard demonstrate how 360° video and green screen tools can bring history alive and develop a sense of agency for primary pupils engaged in the co-creation of historical spaces. At the other end of the learner journey, Dr Kenny Hendrickson and colleagues explore how social-emotional factors impact university students' navigation of online learning, and why turning cameras off might reflect positive self-awareness rather than disengagement. Similarly, Emma Goto and Dr Chris Shelton remind us that digital participation is not just about skills, suggesting that cultivating reasonableness can help pupils develop the ability to respond to online information in more balanced ways.

The second theme across this edition is 'immersive, ethical and inclusive learning', speaking to some of the deeper questions behind digital innovation. Dr Kim Sadique's compelling piece, 'Behind the Srebrenica Flower', describes the creation of a virtual Bosnian genocide room that allows learners to explore difficult histories and complex ideas in a sensitive way.

Lorna Robinson reflects on the promise and limits of AI for supporting children's learning, while Alison Hramiak urges us to slow down and question assumptions about technology use. Looking across the whole system, Gavin Davenport, Ass. Prof. Andy Connell, Dr Christina Preston and Alan Crist raise a key question: how can we ensure every young person in England develops the digital confidence and critical literacy they need to thrive?

Together, these bold and hopeful pieces create a rich picture of digital learning today across learning phases. They highlight that the thoughtful use of creative tools that respond to learners' needs can deepen understanding while also prompting ethical reflection and inclusion.

In the recommended reads, we look ahead to consider what the future for digital competence and skills could look like. We hear from Dr Elizabeth Hidson in her response to the curriculum and assessment review and Professor Sarah Younie about her work presented to UNESCO on teacher agency and AI. Raspberry Pi have released their sustainability portal, and we finish with a review of 'Reimagining teacher digital competence' (Egan, Johnston and McGarr, 2025), which considers ethical dilemmas raised by professional digital competence demands. It urges readers to take a critical eye to what constitutes digital competence, debunking the idea of a 'teacher as a technician' and rather reimagining the depth of skills and knowledge needed to be considered digitally competent.

Clear messages are that innovation must ensure that learning is accessible to everyone, not just the digitally confident, and that digital learning is at its best when it keeps humanity at its centre. We hope you enjoy this edition and that it sparks new ideas about how we can continue to reimagine digital education together.

Dr Helen Caldwell and Dr Emma Whewell

Editorial Team (L to R): Dr Christina Preston, Dr Helen Caldwell, Dr Emma Whewell, Yasemin Oezcelik

Chairs' welcome

On behalf of NAACE: welcome to the autumn edition of the *Advancing Education Journal*. I hope you are enjoying the build-up to the festive season with all the challenges this brings.

At NAACE we have been awaiting the publication of the Department for Education's Curriculum Review documents that are now available and form the basis of our 'homework' in the coming weeks to see how NAACE can best support schools in implementing the new guidance. There may be implications for the content of the EdTech Review Framework, which our Writing Group are currently preparing to consider. I have a feeling that the topic of AI will arise once or twice in our future discussions and documentation. There are some interesting articles about AI in this edition too.

Happy reading, happy Christmas and a peaceful 2026 to all our readers!

Phil Blackburn
Chair
NAACE Board of Management

I am delighted to write my first introduction to *Advancing Education* as the incoming Chair of TPEA. Taking on this role at our recent AGM is both an honour and a privilege, and I look forward to working with colleagues across our sector on the important work ahead.

This edition arrives at a crucial moment for computing and digital education in England. The recent publication of the Curriculum and Assessment Review (CAR) has created significant momentum for evolution and change. Whilst we welcome many aspects of the review, particularly its recognition that digital literacy must be explicitly taught rather than assumed, it also reinforces the urgent need for a comprehensive digital skills framework for England.

I am therefore particularly pleased to draw your attention to the article in this issue titled 'Towards a digital skills framework for England'. This work emerged from collaborative work at our 37th annual conference this summer and represents a cornerstone of TPEA's strategic direction as we move into our 40th year as an association. The development of the framework requires a child-centred approach to embedding essential digital competencies across all subjects and age phases, learning from the comprehensive approaches already developed in Wales, Scotland and Northern Ireland.

The CAR has opened the door for these vital conversations about how we prepare young people not just for specialist computing careers but for lives in which digital literacy, media literacy and digital citizenship are fundamental to learning, civic participation and lifelong opportunity. TPEA stands ready to work with government, schools, awarding bodies and fellow associations to bring this vision into being.

I hope you find this edition timely, inspiring and thought-provoking.

Dr Elizabeth Hidson
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From slate to screen: primary learning building interactive heritage resources through 360° and green screen tools

Dr Julian Ayres and Monty Kennard

Abstract

This case study outlines the implementation of 360° cameras, green screen and online immersive space tools – which helped a Welsh primary school, in collaboration with Wrexham University and the National Slate Museum in Llanberis – as part of the Welsh Collaborative for Learning Design group funded by the Welsh Government to create an online heritage time capsule tool during the museum's three-year restoration closure. The ambition of the project was to utilise new and emerging technologies to help engage the learners in furthering their connection to their local history while developing skills as part of the Digital Competence Framework.

Keywords: immersive technology, education, Curriculum for Wales, Digital Competence Framework, digital skills, pedagogy, teaching

Introduction

The Welsh Collaborative for Learning Design (WCLD) has been established to enhance the capacity of education settings to integrate digital tools effectively within teaching and learning (Welsh Government, 2022). This remit aligns with national priorities set out in the Curriculum for Wales guidance (Welsh Government, 2020) and the Digital Competence Framework (DCF; Welsh Government, 2018), which emphasise digital innovation as central to developing learners who are creative, confident and ethically informed citizens.

This project was developed in partnership with the National Slate Museum in Llanberis, Wales, during its closure for restoration, and with staff at Wrexham University. Funded through the WCLD, it involved collaboration with a local primary school to create an online 'time-capsule' virtual-reality tour resource. This resource integrated students' digital outputs, such as Welsh-language songs, artwork and presentations, with immersive technologies, including 360° cameras and interactive platforms.

In doing so, the initiative not only promoted digital engagement but also celebrated Welsh language, history and culture, supporting the Welsh Government's ambition for an integrated, holistic approach to curriculum design (Welsh Government, 2024).

Literature and theoretical context

In the Welsh educational context, immersive technologies align seamlessly with the Curriculum for Wales, which emphasises creativity, collaboration, critical thinking and problem-solving through digitally enhanced experiences (Welsh Government, 2020).

Immersive technology, defined as technology that seeks to emulate aspects of the physical world through digital simulation and sensory engagement (Pavithra *et al.*, 2020), has been widely recognised for its value in enhancing learners' engagement, motivation and confidence in working with new and emerging technologies (Best *et al.*, 2024; Tenorio and Chua, 2025; Tene *et al.*, 2024). The DCF further underscores the need for learners to develop digital proficiency to navigate a technology-driven society (Welsh Government, 2018).

Collaborative learning, a cornerstone of effective pedagogy, fosters group interaction and knowledge exchange, helping to enhance digital competencies that are critical for modern education (Best *et al.*, 2024; Tenorio and Chua, 2025). Within the Welsh educational framework, collaborative practice is emphasised as vital for developing learners' critical and analytical skills (Welsh Government, 2024). Grounded in constructivist theory, which positions learners as active creators of knowledge, this approach aligns with digital pedagogy to integrate immersive technologies into culturally relevant education (Welsh Government, 2020). By utilising immersive technology tools, such as 360° cameras and interactive platforms, this framework bridged theoretical principles with practical application, enabling learners to construct meaningful, context-driven knowledge that reflects their cultural heritage and community identity (Welsh Government, 2018).

Methodology and project design

The project was conducted in partnership with a primary school local to the museum, with the aim of positioning pupils as co-creators and documenters of their own heritage while

encouraging them to recognise and value the significance of their local area. The design emphasised both technological engagement and creative participation, ensuring that pupils developed technical competencies alongside opportunities for cultural expression. By situating the project in their own community context, pupils were able to see their surroundings as meaningful sites of learning, memory and creativity. Technology was treated not as an end but as a mechanism for child-led, multidisciplinary learning.

The methodology centred on the use of 360° cameras (Insta360 X3), the platform ThingLink and open-source 360° web tools, enabling the development of the immersive, interactive environment. Learners were introduced to the technical processes of capturing 360° imagery and green screen video and were supported in producing original creative artefacts, including songs, artwork and presentations that could be embedded within the digital space. This combination of technical practice and creative contribution promoted digital literacy, engagement with heritage themes and reflective decision-making.

The project workflow included curating and editing visual and audio materials, integrating them into navigable 360° environments, and customising interactive hotspots to reflect learner contributions (see Image 1).

Figure 1: Home screen and contents of the National Slate Museum VR tour

Ethical considerations shaped every stage of the project. Safeguarding measures included producing two versions of the time capsule: one restricted, containing children's creative outputs for school use only, and one public, free of identifying content. This approach safeguarded participants while ensuring their contributions remained central to the resource. Additionally, parental permission for filming was sought throughout the process, with data stored securely and used for the clearly defined, original intention.

By combining immersive technologies with learner-developed content, the project demonstrated how primary learners can move from passive engagement to become active facilitators of their own learning, where technology drives a passion for culturally relevant investigation. The project illustrates the potential for partnerships between schools and cultural institutions to generate interactive, sustainable and ethically grounded educational resources.

Findings and reflections

The project generated high levels of motivation and engagement among pupils. For many, the most meaningful aspect was not in the novelty of the technologies but the opportunity to create, to collaborate and to showcase their knowledge in new and expressive ways.

This sense of ownership highlights a central finding: immersive tools function best as enablers of creativity rather than as goals in themselves.

In terms of digital literacy, pupils gained practical skills in using 360° cameras and green screen technologies. However, they had less involvement with the editing processes and the integration of multimodal content into the interactive environment, which limited their understanding of the full production process. Alongside technical skills, learners also developed key transferable skills, including teamwork, problem-solving and reflective evaluation.

Despite an initial positive engagement, recognising that the project clearly aligned with primary curriculum content and offered opportunities for cross-curricular learning and

heritage preservation, some teachers became disengaged during the final processes due to workload and scheduling conflicts, resulting in challenges surrounding summative organisation and communication.

Despite these challenges, the multi-phase approach provided a concrete means of linking curriculum content with creative media and resulted in opportunities for cross-curricular learning and heritage preservation for all those who engaged. The project showed how creative media can extend classroom learning into broader community contexts, both geographically and across time.

Technical barriers also occurred. Green screen work was constrained by lighting, space and equipment limitations, while digital platform selection raised concerns regarding cost, usability and safeguarding. Affordable tools often lacked user-friendliness, while subscription-based platforms created problems around sustainability and privacy. These issues underline the importance of secure, accessible platforms for future projects. Though the software ThingLink was initially selected for its accessibility and features, it presented challenges related to privacy and cost. We therefore shifted to open-source alternatives, which reduced subscription barriers but relied heavily on technical expertise, limiting both children's and the teacher's direct involvement in the digital construction due to the need for technologically specific training.

The benefits of the use of immersive technology in this context, from an experiential point of view, are clear. Pupils responded with enthusiasm and instinctive adaptability, suggesting that exposure to such tools lays a foundation for navigating an increasingly digital world. At the same time, reflection is needed on how far immersive technologies should shape formal education, given concerns around privacy, dependency and wellbeing.

Discussion

This project effectively bridged theoretical frameworks, such as digital pedagogy and constructivism, with practical classroom implementation. Rooted in constructivist principles, it positioned the pupils as active co-creators of knowledge, using immersive technologies like 360° cameras and ThingLink to construct meaningful representations of their local Welsh heritage.

By situating technology within community contexts, the initiative aligned theory with practice, enabling pupils to recognise their surroundings as sites of cultural significance and personal expression, rather than treating tech as an isolated tool.

For emerging educator-researchers in digital and immersive tools, the project offered valuable insights into balancing technological novelty with pedagogical depth. It highlights practical challenges like platform usability and teacher engagement, urging future studies to prioritise ethical safeguards and inclusive workflows. Researchers can build on its findings to explore scalable models that enhance motivation through ownership while addressing limitations in full-cycle involvement to deepen understanding of immersive technology's role in constructivist education.

Conclusion and future directions

This project significantly enhanced learner motivation, digital literacy and skills such as collaboration and problem-solving, positioning pupils as active documenters of Welsh heritage (Welsh Government, 2020). Teachers benefited from cross-curricular opportunities, integrating creative media with curriculum goals (Welsh Government, 2024), though challenges in engagement highlight the need for targeted professional development. The wider community gained a sustainable, interactive resource preserving local cultural sites, fostering intergenerational connections and regional identity.

The project's framework demonstrates scalability for other Welsh heritage sites, such as castles or industrial landmarks, through school partnerships. Future directions also include embedding the time capsule in museum exhibits for ongoing engagement, supported by community-driven updates.

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Authors

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Dr Julian Ayres is a senior lecturer and programme leader for the PGCE Post-Compulsory Education and Training at Wrexham University, with experience in teacher education focusing on resilience, creativity and innovation.

His research examines reflective practice, digital pedagogy and teacher resilience. An advocate for inclusive, evidence-based practice, he presents at conferences on topics including AI in assessment, creative teaching and educator identities, promoting research-led and sustainable professional development in lifelong learning.

Monty Kennard

Monty Kennard is a research associate at Wrexham University with a background in primary education. His research focuses on the intersections of education, technology and psychology, with particular interest in how technology relates to neurodiversity and mental health.

He holds a degree in economics, politics and international relations, a PGCE (QTS) and an MSc in computer science. This diverse academic background allows him to combine a passion for teaching with expertise in technology and research, bringing innovative and practical approaches into educational settings.

Monty's current projects explore the impact of immersive technologies on psychosocial literacy, as well as the ways in which medical, legal, social and identity-based framings of autism intersect, conflict and influence policy, research and lived experience.

Implementing educational technology in early years childminding settings: a structured plan for real-world application

Lucy Tidd

Introduction

This article examines the integration of educational technology to support communication within early years (ages birth to five years) childminding settings in the UK, focusing on enhancing communication between childminders and parents and improving the tracking of children's developmental progress. Grounded in constructivist and socio-constructivist theories and informed by the Substitution, Augmentation, Modification and Redefinition (SAMR) and Technological Pedagogical Content Knowledge (TPACK) frameworks, the study proposes a structured implementation plan. It evaluates various digital platforms, addresses potential barriers and considers ethical, cultural and legal implications, aiming to inform policy and practice in early childhood education.

The increasing role of technology in early years education in England necessitates an evidence-based approach to its integration (Department for Education, 2021). This article explores a real-world educational issue: communication and engagement between childminders, parents and children. It also proposes a digital solution to address these challenges. The discussion draws upon educational theories such as Vygotsky's sociocultural theory (Vygotsky, 1978) and models of technology integration like the SAMR model (Puentedura, 2010). It also analyses ethical, cultural and legal considerations (British Educational Research Association, 2018) and proposes a sustainability plan to ensure the long-term effectiveness of the approach.

Identifying the educational challenge

One of the fundamental challenges in early years education in England is establishing effective communication and engagement between childminders and parents while ensuring that children's developmental progress is systematically tracked (Taggart *et al.*, 2015). Traditional paper-based observation and record-keeping methods present inefficiencies, potentially leading to fragmented assessments of a child's growth (Elfer, Goldschmied and Selleck, 2012). Additionally, parents may struggle to receive timely and detailed feedback regarding their child's experiences in a childcare setting (Goodall and Montgomery, 2014). To address this issue, the integration of digital learning portfolios and real-time communication platforms offers a robust solution. Digital tools can provide a dynamic and interactive method for tracking developmental milestones, enabling childminders to document learning experiences effectively and share them with parents instantaneously (Marsh *et al.*, 2017).

Transformational potential of technology

The integration of educational technology, such as Times Tables Rockstars, YouTube and Reading Eggs, in early years settings has the potential to transform traditional pedagogical approaches. Research indicates that digital tools can foster higher levels of parental engagement (Plowman and McPake, 2013), provide real-time formative assessment opportunities and streamline administrative tasks for childminders. Learning platforms such as Tapestry and ClassDojo align with the Early Years Foundation Stage (EYFS) framework by facilitating individualised learning plans and supporting child-led exploration. Additionally, multimedia tools enable richer documentation of learning experiences, capturing children's creative and cognitive development through videos, photographs and audio recordings. This fosters a more comprehensive understanding of a child's progression, allowing for more informed pedagogical strategies and interventions (Cowan and Flewitt, 2021; Escamilla *et al.*, 2021; Walters, 2006).

Barriers to implementation

Despite the benefits, several barriers impede the successful implementation of educational technology in early years settings. Financial constraints can limit access to digital tools, with high initial investment costs and ongoing subscription fees posing significant challenges (Nutbrown, 2012). Furthermore, digital literacy among childminders, parents and support staff varies, necessitating structured training programs to ensure competency in using new platforms effectively (Aubrey and Dahl, 2014). Data protection and privacy concerns, particularly in compliance with GDPR regulations (ICO, 2018), require stringent safeguards to prevent misuse of personal information. Additionally, cultural and institutional resistance

to change may hinder the adoption of new technologies, as traditional early childhood education methodologies are often deeply embedded within pedagogical practices (Plowman and Stephen, 2005). Addressing these barriers requires strategic planning, policy alignment and targeted professional development initiatives (Blamire, 2010).

Evaluation of digital platforms

Digital learning portfolios offer a structured mechanism for tracking child progress, while interactive apps encourage engagement through digital storytelling and multimedia learning experiences. Parental engagement tools improve communication by allowing real-time access to children's learning journeys. However, successful implementation hinges on providing adequate training for childminders and ensuring equitable access for all families. Research by Selwyn (2017) underscores the necessity of professional development and ongoing technical support to foster confidence in utilising digital tools effectively within early childhood settings.

Which app?

Choosing the right online communication or journal app is an important decision for early years providers. Strong parent–practitioner partnerships have been shown to enhance children's learning, development and wellbeing (Sylva *et al.*, 2010). The right digital platform can strengthen these relationships while streamlining observation, documentation and daily communication.

Key features to consider include user-friendliness for both staff and families, compliance with GDPR for data protection and alignment with the EYFS. Look for tools that support observations, allow photo and video uploads and facilitate real-time communication with parents (Nutbrown, 2012; Plowman, McPake and Stephen, 2012).

Several platforms are popular in early years settings:

- **Tapestry** is one of the most widely used digital learning journal platforms across nurseries and childminding settings in the UK. It is designed around the EYFS, allowing practitioners to capture observations through photos, videos and written notes that link directly to developmental outcomes. Parents can log in securely to view their child's progress, contribute comments and share home learning experiences, which strengthens the home–setting partnership. Its intuitive interface makes it accessible even for less tech-confident staff, and its reputation for reliability has made it a trusted choice among early years providers.

Figure 1: Tapestry (Little Explorers, 2024)

- **Famly** offers an integrated approach that combines learning journals with administrative features, making it a popular choice for nurseries and larger childminding businesses. As well as tracking observations and progress, the platform includes registers, accident and incident forms, invoicing and digital permissions. Its messaging tool allows for instant, secure communication with parents, reducing reliance on paper forms and notices. Famly's design is straightforward, but its breadth of features means it can support not only the educational side of EYFS but also the operational management of a setting, saving practitioners valuable time.

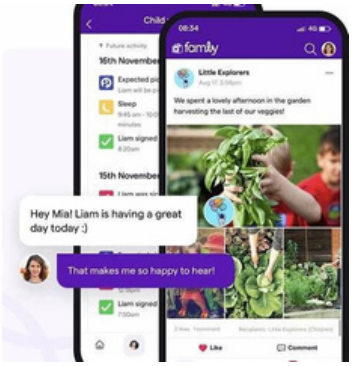

Figure 2: Famly (Famly, n.d.)

- **ClassDojo** is best known in school environments but has found a role in early years settings that want simple, accessible communication tools. Its core strength lies in behaviour tracking and sharing 'moments' of children's learning with parents in real time. For childminders, this can offer a straightforward way to involve families in their child's day and promote positive behaviour reinforcement. However, it lacks some of the in-depth EYFS assessment and safeguarding functions of other platforms, so it is often used alongside other systems rather than as a standalone solution in nurseries.

Figure 3: ClassDojo (Google Play, n.d.)

- **LearningBook** positions itself as a security-first digital learning journal, designed specifically with safeguarding in mind. It is a tablet-based system that allows practitioners to quickly capture observations and securely store them in the cloud. Parents are given controlled access to their child's records, ensuring sensitive information is handled appropriately. The platform is particularly valued by providers who prioritise digital safety and want confidence in data protection while still benefiting from multimedia documentation of children's progress.

- **Seesaw** is an adaptable educational platform used in a variety of contexts from primary schools to early years settings. It enables children's learning to be captured and shared through photos, videos, drawings and voice recordings, offering a creative way to involve families in the learning process. While it is not EYFS-specific, its flexibility means it can be adapted to support observation and parent engagement in nurseries. Seesaw is particularly useful for encouraging home–setting links, although it may require practitioners to adapt its tools to align closely with EYFS outcomes and safeguarding expectations.

- **Baby's Days** is marketed as a complete solution for childminders and nurseries, combining learning journals with daily diaries, attendance registers, EYFS progress tracking, invoicing and parent communication. Parents can log in to see daily updates on meals, sleep and activities, which helps strengthen transparency and trust. For practitioners, having all operational and educational tools in one system reduces duplication and paperwork and supports compliance with Ofsted expectations. The system is particularly attractive for sole childminders who want an all-in-one platform, though the breadth of features means staff training is essential to ensure it is used effectively (Baby's Days, 2025).

Every setting is different, so it is important to consider factors such as the size of the team, budget, staff confidence with technology and family engagement (Stephen and Edwards, 2018). Most importantly, decide whether the priority is administrative support, learning documentation or improving parent communication.

Considerations for settings

The deployment of technology in early years education must be examined through an ethical and legal lens. GDPR compliance is paramount in safeguarding children's data, necessitating secure storage, controlled access and transparent data-sharing policies (ICO, 2018). Equity and inclusion must also be prioritised to ensure that technology does not exacerbate existing socio-economic disparities (Livingstone and Blum-Ross, 2020). Digital platforms should reflect diverse cultural backgrounds and learning styles to promote inclusivity (Plowman, Stephen and McPake, 2010). Furthermore, safeguarding policies must be in place to regulate screen time and prevent exposure to inappropriate digital content (Ofcom, 2023). Ethical concerns around passive consumption versus active learning should also be addressed, ensuring that technology supplements, rather than replaces, human interaction and hands-on learning experiences (Siraj-Blatchford and Whitebread, 2003).

Sustainability plan

For long-term viability, a sustainability plan is necessary. Financial sustainability can be achieved through external funding, government grants and strategic partnerships with educational technology providers (Education Endowment Foundation, 2021).

Ongoing professional development programs must be embedded within training frameworks to ensure educators remain proficient in using digital tools (Aubrey and Dahl, 2014). A user feedback loop, encompassing surveys and observational studies, will provide continuous data to refine and enhance implementation strategies. Scalability is another crucial factor for settings, allowing for the adaptation and expansion of digital solutions in response to technological advancements and evolving educational needs. Research by Flewitt, Messer and Kucirkova (2015) emphasises the importance of embedding digital literacy within early childhood education to ensure a sustainable approach to technology adoption.

Summary

The process of integrating educational technology in an early years setting presents both opportunities and challenges. Digital tools can promote enriched learning experiences, foster parental engagement and offer flexible methods of documenting progress (Plowman *et al.*, 2012). However, the implementation of such tools must be strategically aligned with established pedagogical frameworks to avoid superficial or passive use (Siraj-Blatchford and Whitebread, 2003).

A critical consideration is ensuring that technology remains a facilitative tool, complementing rather than replacing hands-on exploration, social interaction and play-based learning, which are foundational in early childhood education (Wood, 2013). Over-reliance on digital media can risk diminishing these core aspects, especially if educators lack sufficient training or resources to integrate tools meaningfully (Aubrey and Dahl, 2014).

Lessons drawn from this planning process highlight the need for adaptability in both practice and policy. Continuous professional development is essential to equip practitioners with not only the technical skills but also the critical digital pedagogy necessary to make informed choices about tool use (Livingstone and Blum-Ross, 2020). A research-informed approach ensures that implementation is grounded in evidence rather than driven by technology trends alone.

Future developments should focus on refining digital learning tools to support individualised learning trajectories through adaptive content and real-time feedback mechanisms (Flewitt, Messer and Kucirkova, 2015). Simultaneously, ethical concerns such as screen time, data protection and accessibility must remain central. Maintaining the human element – through responsive adult-child interactions and co-play with technology – will be key to ensuring that digital integration continues to support, not substitute, holistic child development (Plowman and Stephen, 2005).

Conclusion

In conclusion, the integration of technology in early years settings offers substantial benefits in communication, engagement and developmental tracking (Plowman *et al.*, 2012). However, its success is contingent upon more than just access to devices. Strategic planning, robust training frameworks and ongoing support are essential to ensure that practitioners use digital tools effectively (Aubrey and Dahl, 2014). Equally important are ethical considerations, including data protection, equitable access and safeguarding (ICO, 2018).

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Behind the Srebrenica Flower: a pedagogical approach to developing a virtual Bosnia genocide room

Dr Kim Sadique

Introduction

Currently, the only genocide that is compulsorily taught within the national curriculum in England and Wales is the Holocaust, and this is delivered at Key Stage 3 within the subject of history, although it can also be covered in PSHE, Citizenship or English. Many educators say they struggle to deliver genocide education because it is difficult knowledge (Britzman, 1998), knowledge which is contested and contentious, because it is inherently political and legally complex. Most educators I have spoken to state they find 'safety' in a fact-based approach and very rarely use the word 'genocide'. Beyond the 'fact-based' approach it is unsettling/uncomfortable to learn from the suffering of others and, therefore, difficult to deliver in a way that is meaningful. Outside of the classroom, genocide education is most often undertaken through visits to memorial museums, many of which are also former sites of mass atrocities (authentic sites) such as Auschwitz-Birkenau State Museum (Poland), Tuol Sleng Genocide Museum (Cambodia) and Srebrenica Memorial Centre (Bosnia). These sites provide an immersive experience with learners "seeing where it happened" (Slovic, 2007) and experiencing an affective, 'felt' impact of being in place. But can we achieve a similar experience in the classroom? Can we use a virtual world as an authentic site of genocide for educational purposes? This paper explores the creation of a virtual Bosnia (genocide) room, behind the Srebrenica Flower.

Figure 1. Image of the Srebrenica Flower entrance to the virtual Bosnia (genocide) room

The Srebrenica genocide

During the break-up of the Former Socialist Republic of Yugoslavia, war broke out in a number of the countries of the Federation, the deadliest being in Bosnia and Herzegovina, with mass atrocities committed across the entire country. The systematic killing of over 8,000 Bosnian Muslim men and boys and the forced deportation of over 25,000 women, children and the elderly that took place in and around Srebrenica in July 1995 are, however, the only atrocities that occurred in Bosnia to be legally established by the International Court of Justice as genocide.

Bridging the gaps in genocide education

The literature on educating about difficult knowledge highlights some of the gaps in the learning experience, particularly in terms of relying on the fact-based approach as a means to 'learn about' genocide. Britzman (1998) notes that acquiring facts from learning *about* an event allows the learner to remain detached from what can be learned and ensures learning is superficial. However, learning *from* an experience facilitates insight and a deeper, more meaningful engagement with the topic.

For a learning experience on genocide that is meaningful, we must see where it happened, situate it within a discussion of the systematic nature of state crime and how it was perpetrated, and consider the wider socio-cultural context in which it occurred (Stoddard, 2022). In addition, it is essential to provide the "story of one" (Slovic, 2007) to evidence individual loss and suffering, and resistance/victim agency through the use of survivor narratives, as well as narratives from those who intervened or responded. Most importantly, we must educate on what we can do with this knowledge so that we may learn *from* genocide rather than leaving learners emotionally overwhelmed or "affectively disempowered" (Sadique, 2024).

The virtual world as educational tool

Within educational settings, virtual worlds have been considered as tools offering the possibility of deep learner engagement through the means to explore, and a space to situate representations of, real-world places and complex concepts (Dalgarno and Lee, 2010; Kim, Lee and Thomas, 2012). Such virtual environments provide a multisensory, immersive experience and a sense of being in place (Zuiker, 2012).

Designing a virtual Bosnia room

The characteristics of a virtual (learning) environment situate learners in relatively authentic learning spaces, which share similarities to those of memorial museums, so translating one to the other seemed a good place to begin. But as Britzman (1998, 2000, 2013) argues, representations are insufficient and can never match the absences and consequences of historical trauma, so any virtual space would need to do more than merely represent an authentic site. What came to mind when asked to design the Bosnia room was the work of Micieli-Voutsinas (2017) and his consideration of more-than-representational space. In simple terms, this was a shift in memorial museum design, away from artefacts and texts to spaces which declare their meaning (evidence of evil/human suffering) and have meaning projected on to them (loss, suffering, etc). They are places where we engage in an embodied experience with the space and where the affective (emotional) impact produces reactions to what happened there (Bickford, 2014).

More-than-representational space

Designing a virtual space that was more than representational so that learners could "see where it happened" (Slovic, 2007), experience the sense of "being in place" (Williams, 2007) and engage was vital. As Yanow (1998) states, buildings are the storytellers as much as they are part of the story being told, and so it was decided to replicate the building complex at the centre of the Srebrenica genocide. The site was a former battery factory in the east of Bosnia, later used as a base by the UN Dutchbats where approximately 20,000 people sought refuge in July 1995. The site is now the Srebrenica Memorial Centre and Potočari Cemetery. Images of this site were readily available on the internet, and so the designers were able to accurately recreate this in the virtual world. A key decision was made to have three 'versions' of the same building complex/area – in spaces identified as 'before, during and after' genocide. This was used to show the impact of genocide on one place, Potočari in Srebrenica.

Figure 2. Image from 'during the genocide': the UN Dutchbat base at Potočari, Srebrenica

Operationalising a more-than-representational space

My work on memorial museum education had already argued that a place becomes a space of meaning when it is operationalised – it is the movement around a place and the feelings and connections such navigation evokes. The virtual space required sights, sounds and narratives that would facilitate understanding of the people, the place and the events that happened there.

The more-than-representational café, with its traditional coffee pots (džezva) and cups (fildžan), centre coffee as a culturally significant and recurring theme through which to explore the impact of genocide. Traditional Bosnian folk music (sevdah) and survivor testimony play from the radio in the café, exploring narratives of religio-ethnic division and later loss and suffering. Taken together, this provides the sensual/perceptual context alongside an established and authenticated narrative (Barab *et al.*, 2007) of genocide and mass atrocities, reflecting the fundamental tenets of situated learning (Brown, Collins and Duguid, 1989).

Figure 3. Image from 'before the genocide': socio-cultural representations of Bosnia, including coffee and rug making

Narrating *of* or *in* a virtually authentic space

Beyond the design of the space, consideration needed to be given to what and how narratives were shared. This then led me to thinking about the theory of guiding I had already established, highlighting the difference between "narrating *of* or *in* an authentic site" (Sadique, 2024). In many memorial museums situated in 'authentic sites', guide-educators 'narrate the space' using the buildings and places as the primary storytellers ('In this building x happened') and individual victim narratives to tell the 'story of one' in that place. But for the Bosnia Room it was important to address the 'gaps', contextualising events by saying this is how and why it started, what happened (using the Ten Stages of Genocide), and explaining that some of the events presented happened here in this place (but not all), centring the narrative rather than the buildings, which I refer to as 'narrating in' an authentic space. This was undertaken through inclusion of information points throughout the three spaces that contextualise the place and events of Srebrenica within the wider mass atrocities committed in Bosnia. This is supported by the use of music, narrative/testimony and sounds to provide a fully immersive experience and use a consistent reference theme (coffee/café) in the 'before' and 'during' spaces to demonstrate the personal impact of genocide that educators can use to engage learners.

The art exhibition, situated in the warehouse at the back of the UN Dutchbat base, explores the experiences of victims, survivors and responders. It includes images of the work of forensic technicians involved in the identification of victims and the evidence gathering process for prosecutions for war crimes, crimes against humanity and genocide.

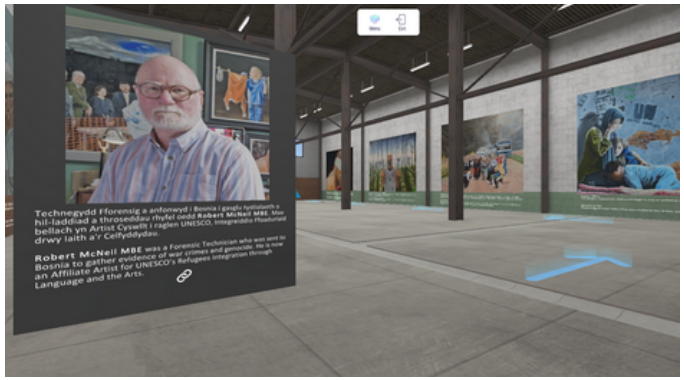

Figure 4. Image from 'during the genocide': art exhibition by former UN forensic technician

To explore 'after genocide', the Bosnia Room provides access to the Potočari Cemetery, depicting the almost 7,000 graves of victims whose bodies have been recovered. The song "White Flower", written by a genocide survivor, plays as learners enter the site. To fully understand the aftermath of genocide, an information point explores the evidence from mass graves used in the proceedings of the International Criminal Tribunal of Yugoslavia (ICTY).

Figure 5. Image from 'after the genocide': Potočari Cemetery

The final space 'The Future' has links to further learning, as well as reflection and action opportunities. The Srebrenica Memorial Centre and Remembering Srebrenica links take educators/learners to additional information and/or learning materials, which can facilitate discussions about what active citizenship looks like and what we can learn *from* genocide.

Conclusion

The virtual Bosnia Room is a free, open-access, pedagogically underpinned virtual learning environment that presents an authentic, more-than-representational and immersive space. It addresses the gaps in genocide education by situating the genocide in Srebrenica within a wider context of mass atrocities in Bosnia. Furthermore, it provides opportunities for discussions around international law (crimes against humanity and genocide), the role of the UN, culture, religion and identity in Bosnia, the role of nationalist narratives in creating societal division, as well as the experiences of victims, survivors and responders. There is a 'future' section, providing further learning resources and the opportunity for taking action to prevent hate and discrimination.

The Bosnia Room was funded as part of Anti-Racism Wales Agenda 2030 and can be found (on the first floor) at: https://www.antiracism.wales/

For more information and a free teaching guide, email ksadique@dmu.ac.uk.

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Cameras turned off in synchronous online courses: students' perspectives

Dr Kenny Hendrickson, Dr Deneil Christian, Dr Ameeta Jadav

Introduction

Most of the current research on synchronous online courses focuses on the belief that students keeping their web cameras on is a good indicator of their presence and course engagement (Händel *et al.*, 2022). In fact, many universities and their faculty have developed protocols to mandate camera utilisation (Schwenck and Pryor, 2021). However, during the COVID-19 pandemic, students' feelings and views towards visual presence in online courses changed. The change in students' online behaviour reached the point of a growing reluctance in keeping their cameras on (Castelli and Sarvary, 2021). Thus, this current work explores university students' reasons for turning off their cameras for synchronous courses from the positive position of self-awareness in learning environments. Self-awareness can be defined as an individual's ability to perceive self in the present moment or real time (Yao *et al.*, 2022). Tadros *et al.* (2023) note that previous studies have shown that students' self-awareness in tandem with engagement affects their experience in online learning.

Can exploring the relationship between students' perceived acceptable reasons for turning off their cameras, engagement in live online courses and preferences concerning camera usage provide insight into their self-awareness in online learning?

Camera usage, student engagement and self-awareness

Camera usage in synchronous online courses has been identified as a key factor in ensuring student engagement (Kushlev and Epstein-Shuman, 2022). Wut *et al.* (2023) define *student engagement* as "student participation in the learning process, such that students are expected to fulfill learning outcomes set at the beginning of the course" (p. 4). Student engagement is critical and a main priority in online courses, as it is believed that keeping students engaged or connected in course sessions results in their learning (Wut *et al.*, 2023). However, Händel and his collaborators (2022) observed that there is a significant need for empirical studies that examine students' reaction to stimuli that prompts non-use of cameras in synchronous online courses.

Grothaus (2022) found that while camera use supports students' social presence, it can also create a reluctance to engage due to students' concerns about how they are viewed by their classmates and instructors. In their study, Castelli and Sarvary (2021) also discovered various reasons students turn off their cameras, their appearance being the most common concern. Similarly, Li *et al.* (2022) confirm that students turn off their cameras due to "self-appearance and privacy" and "avoidance of peer judgment" (p. 152). Thus, camera usage in synchronous online courses points to a need for understanding self-awareness in students' course experience.

Oittinen, Háhn and Räisänen (2022) note that camera use in e-learning courses create an induced objective self-awareness in students, an increasing consciousness and alertness of "being seen and watched by others" (p. 26). Campbell *et al.* (2022) offer domains of objective self-awareness: 1.) attention to oneself, 2.) evaluating one's behavior against norms and 3.) experiencing negative effects if one's behaviour deviates from the norm. Specifically, Li *et al.* (2022) and Yao *et al.* (2022) offer that students' objective self-awareness of their camera presence could have a psychological impact (i.e., social anxiety and depression) and adverse consequences on their course engagement. Thus, objective self-awareness theory guided our research strategy in collecting data on students' reasons for turning off cameras, their engagement in synchronous online courses and their preferences concerning camera usage based on their self-evaluation and introspection.

Figure 1 spotlights the conceptual framework used in this study. It illustrates the relationship between reasons for cameras being turned off, student engagement and camera usage preferences as dependent variables. Thus, the conceptual framework provided us with an opportunity to explore the three domains of students' objective self-awareness of cameras being turned off in synchronous online courses.

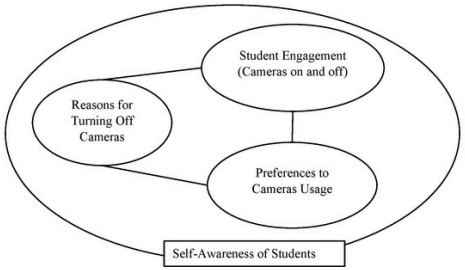

Figure 1. Student Self-Awareness of Cameras Turned Off, Engagement and Preferences

Source: Author's creation/work

Methods

An exploratory research design was used to explore the UVI students' reasons for turning off their cameras and their perceptions of engagement within synchronous online courses regarding camera usage. UVI is the only non-mainland Historically Black college or university (HBCU). UVI is uniquely located in the Caribbean region and nestled within a US territory. The study, conducted in spring and fall of 2022, was based on a convenience sample of 229 university students (i.e., undergraduate and graduate). The research questions for this study were:

1.) What are UVI students' accepted reasons for turning off their cameras during a live video class meeting?
2.) Is there a relationship between UVI students' accepted reasons for turning off their cameras during a live video class meeting and their perceptions of students' engagement when their cameras were on or off?
3.) Is there a relationship between UVI students' accepted reasons for turning off their cameras during a live video class meeting and their preference concerning keeping the camera on/off?
4.) What demographic characteristics are related to the reasons for turning off cameras during a live session, student engagement and preferences concerning camera usage?

Data collection applied a modified cross-sectional survey strategy. This strategy ensured that the data collection was anonymous, voluntary and confidential. In tandem, Microsoft Forms was employed to guarantee that the survey was self-administered and easily accessible. An e-invitation with a survey link was disseminated to students through the university's messaging system. The survey was a modified version of an instrument by Castelli and Sarvary (2021). It consisted of demographic items (i.e., age, ethnic identity, academic status and employment status) and four main questions: a) What are perceived justifiable reasons for students turning off their cameras during a live video class meeting?, b) How would you rate your engagement in your virtual online classes when their cameras were off?, c) How would you rate your engagement in your virtual online classes when their cameras were on? and d) What is your preference concerning keeping the camera on/off when attending a live session?

Data analysis

Descriptive analyses were employed to describe participating students' key demographic attributes and perceptions. The findings are presented in Tables 1 and 2. The main demographic attributes were age, ethnic identity, academic status and employment status. Descriptive analysis, shown in Table 1, displayed that the most significant percentage of participating students were between the ages of 18–22 years old (45%). Students identifying as African American or Black were the main participants (80.7%). Of the participating students, 26% were university seniors, undergraduate students in their final years, and 36% of the participants were employed full-time.

Table 1. Demographics of UVI students
(N= 229)

Age: 18-22 years old= 45% (103); 23-29 years old= 24.5% (56); 30-35 years old= 7% (16); Over 35 years old= 23.1% (53)
Ethnic identity: Asian/Pacific Islander= .9 (2); Black/African American= 80.7% (185); Hispanic/Latino= 5.2% (12); White= 6.6% (15); multi-racial= 3.9% (9); Other= 1% (1) and NA=2.6% (6)
Academic Status: Freshman= 10.9% (25); Sophomore= 18.8 (43); Junior= 20.5% (47); Senior= 26.6% (61); Graduate= 21.8% (50)
Employment Status: Employed Full-Time= 36.2% (83); Employed Part-Time= 30.1% (69); Self-Employed= 3.1% (7); Retired= 2.6% (6); Student employees; .8% (2); Unemployed= 25.3% (58); NA= .4 (1)

Source: Author's creation/work

Table 2 showcases the participating students' responses to the survey, presenting the 14 justifiable reasons for turning off their cameras during a live video class meeting. The following six reasons for turning off cameras during synchronous courses had the largest number of selections (greater than 40%): 1.) "I was concerned about my appearance." 2.) "I had a family member/friend in the room with me." 3.) "My internet connection was weak." 4.) "Everyone else had their cameras off." 5.) "I didn't want to be seen stepping away from my device." and 6.) "I didn't want to be seen doing other things." Notably, over 50% of the participants identified concern about appearance as a justifiable reason for turning off their camera during a live video class.

Table 2 also offers three ratings of their engagement during virtual online courses. Of the participants, 41% felt somewhat engaged when their cameras were turned off during virtual online classes; 42% selected "somewhat engaged" during virtual online classes when their cameras were on. Regarding their preference for camera usage in virtual online courses, almost half of the participants believed that faculty should require cameras to be turned on only in specific situations. In contrast, 43% of student participants felt they should have an option or choice regarding using cameras in a virtual session.

Table 2.
Students Perceptions of Camera Usage in Synchronous Courses
(N=229)

What are justifiable reasons for students turning off their cameras during a live video class meeting?
I was concerned about their appearance: Yes= 50.7% (116) or No= 49.3% (113)
I had a family/friend in the room with me: Yes= 48% (110) or No= 52 % (119)
My internet connection was weak internet: Yes= 45% (103) or No 55% (126)
My webcam was not working: Yes= 21.8% (50) or No= 78.2% (179)
I did not want to be seen eating: Yes= 38.9% (89) or No= 61.1% (140)
I was concerned about seen at work: Yes 22.3% (51) or No= 77.7% (178)
I was concerned about everyone looking at me: Yes= 26.2% (60) or No= 73.8% (169)
I was concerned about my physical location: Yes= 36.2 % (83) or No= 63.8% (146)
I was concerned about distracting my classmates: Yes= 17% (39) or No= 83% (190)
I was concerned about distracting the professor: Yes= 10.9% (25) or No= 89.1% (204)
I didn't want to be seen as not paying attention: Yes= 21% (48) or No= 79% (181)
Everyone else had their cameras off: Yes= 41% (94) or No= 59 % (135)
I didn't want to be seen stepping away from my device: Yes= 41.5% (95) or No= 58.5% (134)
I didn't want to be seen doing other things: Yes=43.2% (99) or No= 56.8% (130) and
Cameras should always be on: Yes= 4.4% (10) or No= 95.6 (219)

Of the 14 identified reasons for students to turn off their cameras during an online class meeting, Table 3 presents the five most substantial factor loadings. Because of the dichotomous nature of data, Exploratory Factor Analysis (EFA) with polychoric correlation was used to determine the strongest factor loadings. All factor loadings were greater than .4. The item with the most substantial item loading was "students did not want to be seen doing other things." The factor loading has a strong Cronbach's Alpha of 0.828 and a significance of .000. The factor loadings also demonstrated acceptable sampling adequacy with a Kaiser-Meyer-Olkin (KMO) of 0.76924. The factor score was used as a variable to represent students' perception of justifiable reasons for having their cameras off during a virtual class meeting.

How would you rate your engagement in your virtual online classes when their cameras were off? Very Engaged = 37.6% (86); Somewhat Engaged= 41% (94); Somewhat disengaged=14.4% (33); Very disengaged= 3.9% (9)
How would you rate students' engagement in your virtual online classes when their cameras were on? Very Engaged= 33.6% (77); Somewhat Engaged=42.4 % (97); Somewhat disengaged= 15.7% (36); Very disengaged= 6.1% (14) Not applicable (my camera was always on= 1.7% (4)
What is your preference concerning keeping the camera on/off when attending a live session? Faculty should require that all attendees keep their cameras on= 14.8 (34); Faculty should require cameras on only specific situations= 42.4% (97); Faculty should always leave the option to the attendees= 42.8% (98)

Source: Author's creation/work

Table 3.

Justifiable reasons for students turning off their cameras during a virtual class meeting (N=229)

Item	Factor Loadings
1. Concerned about Appearance	0.515
2. Family and Friends in the Room	0.494
3. Did not want to be seen Eating	0.701
4. Everyone else had their Camera Off	0.737
5. Seen Step Away from Device	0.624
6. Seen doing other things	0.754

Significance= 0.000000
Cronbach's Alpha= 0.828
KMO= 0.76924 (fair)
Source: Author's creation/work

Based on Pearson correlation analysis, Table 4 offers a correlation matrix that correlates the students' perceived justifiable reasons for cameras being turned off, age, ratings of engagement when their cameras were on, ratings of engagement when their cameras were off and their preference in camera usage during a live session. The strength of the correlation matrix was determined based on the following evaluation of associations: a) values between .5 and 1.0 were deemed strong, b) values between .3 and .5 were considered medium and c) values between .1 and .3 were viewed as small. Thus, small correlations were found between the factor scores of the justifiable reasons for students' cameras being turned off and preferences in camera usage. The correlations were significant at 0.05. A small inverse relationship was found among the justifiable reasons for cameras being turned off.

In addition, Table 4 showcases small associations between the age of participants and all other variables, except students' ratings of engagement in live online classes when their cameras were turned off. Age had a medium and strongest association (0.340) with the rating of student engagement in your live online classes when their cameras were on. Age also possessed small inverse associations (see Table 4) with students' justifiable reasons for cameras being turned off and preference for camera usage during synchronous online courses.

Table 4.

Correlation of Student's Perception of Engagement and Justifiable Reasons for Cameras Off (N=229)

	Justifiable reasons for cameras turned off (Factor Score)	How would you rate your engagement in your live online classes when your camera was on?	How would you rate your engagement in your live online classes when your camera was off?	What is your preference concerning keeping the camera on/off when attending a live session?
Justifiable reasons for cameras turned off (Factor Score)	_	-.094 Sig. (.158)	-.134 Sig. (.042)*	.152 Sig. (.021)*
Age	-.179 Sig. (.007)*	.340 Sig. (<.001)*	.115 (.082)	-.214 Sig. (.001)*

*Correlation is significant at the 0.05 level (2-tailed)
Source: Author's creation/work

Discussion

In this work, we set out to empirically investigate participants' perceived reasons for turning off their cameras during synchronous online courses and their relationships with course engagement and preferences for camera usage during live sessions. Specifically, this enquiry offered patterns of logic behind the student participants' reasons for turning off their cameras during live sessions and their perceptions of the course experience. As seen in Table 3, we identified six strongly associated reasons for students to turn off their cameras during a live video class meeting. We also discovered small associations between students' reasons for turning off their cameras and ratings of engagement in live online courses when cameras were turned off or on, along with their preferences in camera usage. Interestingly, a small inverse association was found between justifiable reasons for cameras being turned off and engagement with live online classes when cameras were off.

As seen in Table 4, our research discovered an association between age and all of the studied variables, especially engagement, when cameras were used. The age of students showed little descriptive diversity. Roughly 45% of the participants were between the ages of 18–22. A medium positive association was observed between age and justifiable reasons for cameras being turned on. In addition, a small inverse association was found between age and preference concerning camera usage in a synchronous course. The older students prefer that faculty require cameras to be turned on, while younger students seem to prefer the option of camera usage left to attendees. Age represents a determinant of students' camera usage, social presence and engagement in their courses.

Limitations and future studies suggestions

The current study had some methodological limitations. Firstly, the findings of this work are not generalisable due to the small convenience sample size. Secondly, self-reported data exposes research to the possibilities of inaccuracy and social desirability bias. Thirdly, EFA is limited based on the subjectivity of researchers' decisions. Finally, correlation analysis did not provide prospects of determining causation between reasons for students turning off their cameras during a virtual class meeting or rating of engagement in synchronous sessions and preferences concerning camera usage. While this study offers exploratory evidence to support examining students' reasons for turning off their cameras during synchronous online sessions as identifiers of their self-awareness, future studies on this issue should use a larger, diverse sample size and more predictive analytical techniques to explore other values, assumptions and causality. As this was a quantitative study, qualitative approaches should be employed in future studies.

Conclusion

Students' non-use or decision to turn off their cameras during synchronous online courses has often been portrayed as antisocial behavior, like dismissively or irresponsibly sitting in the back of a traditional face-to-face class. However, the focus and findings of this current study highlight the non-use of cameras as a response to camera-induced self-awareness. This objective self-awareness reflects students' consciousness of how they are publicly perceived by others in their course (i.e., instructor, students). Additionally, our findings support the need for students to be given preference and flexibility in camera usage. Institutions and faculty should formulate strategies for synchronous online courses that consider students' self-awareness, their age and individual circumstances. Finally, we hope that this work initiates conversations and research into the significance of further understanding university students' self-awareness, especially in matters related to presence, engagement and utilisation of technology in synchronous online courses.

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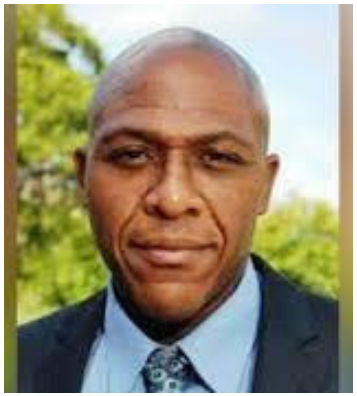

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Encouraging reasonableness in the digital literacy classroom

Emma Goto and Dr Chris Shelton

Introducing reasonableness

We live in somewhat polarised times. In the age of social media, we have become used to people shouting their view, in capital letters, at someone from the opposing side. This phenomenon is not exactly new. In 1938 John Dewey warned us that "Mankind likes to think in terms of extreme opposites" (Dewey, 2007, p. 17); he described warring camps and urged us not to reject ideas just because they were put forward by the other side. Social media brings these warring camps into our homes, encouraging us to pick a side and fight for it, rejecting the other and sticking with our side. Social media algorithms can make it more likely that we receive more content with a similar agenda, creating echo chambers that reinforce bias. We can engage more and more with the ideas of our own camp, and we have a platform from which to loudly reject the other side, at times in quite disrespectful ways. Engaging with discussion on social media can expose us to increased division and potentially nudge us towards more extreme positions that can negatively impact real-world behaviours. Arguably, what we might need now is more reasonableness.

The philosopher Matthew Lipman, who, alongside Ann Margaret Sharp, founded the Philosophy for Children (P4C) pedagogical approach, suggests that reasonableness should be a central aim of education, claiming that "an ideally educated person is said to be a reasonable person" (Lipman, 1992, p. 1). He points out that to be reasonable, we must do more than just listen and participate: we must be critical, proportional and balanced. A reasonable person can weigh up evidence and give evidence-based reasons for viewpoints. Furthermore, a reasonable person listens respectfully and thinks about the reasons put forward by others. When a person is being reasonable, they will change their view when presented with strong evidence that their position is not the most justifiable. This ability to listen to the reasons of others, weigh up evidence and adapt one's viewpoint — only when appropriate considering the evidence — is something that is often missing when opposing groups communicate online.

Why do we need reasonableness in the digital world?

As the world becomes more influenced by AI-driven technologies, the need for reasonableness has never been stronger. By using generative AI, people can quickly produce digital content. For many this can be a fun activity, or they might use generative AI to support them with a professional role. However, we know that generative AI can create content that contains errors or hallucinations due to limitations in the dataset used to train the AI. This content can be spread as misinformation by well-meaning people on social media. Whilst the intention may not have been to deceive, this misinformation can skew people's beliefs. Equally, there are some who may use generative AI for more intentionally malicious purposes. Generative AI can create content that contains disinformation — information that is known to be untrue — that can be used to influence the beliefs and behaviours of others. Communities and organisations can spread disinformation as well as individuals, and this type of content is often designed to fuel division and hatred.

A good example of how the spread of disinformation can influence society is the race riots we saw in the UK in 2024. These riots occurred in the aftermath of the tragic killing of three young girls and the injury of many others in Southport. After this horrific event, rumours began to spread online that the killings were perpetrated by a Muslim asylum seeker. This information was spread widely. There was evidence that this messaging was at times being spread by accounts known to disseminate far-right messages, many of whom may have had an agenda around fuelling division and hatred. In response to these online rumours, there were many race riots in Britain, drawing many adults and young people into criminal behaviour and creating a great deal of fear across communities. This is a clear illustration of how misinformation and disinformation online can negatively influence real-world behaviour.

The rise of social media over the last two decades has meant that more people are accessing news content online through sources that are not held to the same standards as traditional media and journalism. Therefore, we need citizens to be able to think critically about information they encounter online so that they can assess its validity and make

informed judgements. We need them to be able to see beyond echo chambers, consider information carefully and respond proportionally in alignment with Lipman's characterisation of reasonableness. If people can demonstrate reasonableness when encountering information online, it should help to prevent them from being negatively influenced or radicalised and drawn into the types of behaviours outlined above. As educators, if we want to enact change, the place we should begin is in schools so that, as today's children are growing up, they are equipped to behave more reasonably.

How can we develop reasonableness through education?

The importance of developing pupils' ability to respond critically to online media is widely acknowledged. There has been a focus on disinformation and misinformation in 'Keeping Children Safe in Education (KCSiE)' since September 2025. In England, the recent Curriculum and Assessment Review notes that greater online connectivity has amplified the risks posed by misinformation. The review highlights the need to strengthen media literacy in the curriculum, noting that it is essential that pupils apply critical enquiry to appraise information and information sources. There are several approaches that could support children to become more reasonable when evaluating online media. In the following section, we will discuss some of these approaches in more depth.

P4C

P4C is an approach used to develop children's thinking skills. It helps them to develop creative, critical, collaborative and caring thinking. In P4C communities of enquiry, children engage in philosophical dialogue around questions that they have created and democratically selected. These enquiries typically start with a warm-up to get the community thinking together. Then the teacher facilitator introduces a stimulus that gets the children thinking about concepts linked to the stimulus. Based on these concepts, the children generate questions in small groups. A question is then selected democratically for deeper exploration by the community. The dialogue that follows fosters reasoning, respectful challenge and idea building. The teacher acts as a facilitator; they do not tell the children what to think but help them to develop their approach to thinking.

This approach is particularly useful for encouraging reasonableness in a digital world, as P4C enables deeper consideration of philosophical concepts or big ideas. There is a wide range of such concepts linked to digital literacy, such as trust, honesty, privacy, freedom and consent, which can be explored through stimuli such as picture books and videos. Philosophical questions that children develop could include: "Who owns your identity?", "Is privacy the same as secrecy?", "How do we know what is true?" or "Can we trust what we see?"

For those interested in finding out more about P4C, the national charity Thoughtful (previously known as SAPERE) offers a wide range of P4C courses, resources, events and opportunities that give people the skills to thrive in learning and life.

Learning to read critically

Alongside providing learners with the space and opportunity to explore philosophical concepts and big ideas, we can also equip pupils with the skills to read online media in a critical way and to make decisions about its balance or bias. There are many examples that teachers can use to highlight misinformation and to model how pupils can maintain a critical approach to things they read online (and offline). This might include paying attention to the source and authorship of texts (e.g., whether it is independent, verifiable, authoritative, named, etc.), considering the use of quotes or evidence (e.g., the presentation of statistics or graphs) or checking for signs of AI or human manipulation.

A key aspect of reading online texts critically is ensuring that pupils use their existing knowledge to critique what they are seeing. This could be as simple as comparing two newspaper articles that show different opinions (e.g., reports of a sports match from opposing supporters) or trying to identify images that have been manipulated (see, for example, Real or Photoshop).

The online game Two Truths & AI asks you to identify which one of three movie posters has been generated by AI. It has versions for primary and secondary age groups with three levels of difficulty. The game is timed, so it can be challenging at first, but at the end of the

game, a short animation gives the player tips on what to look out for, and they can play again to try to score higher.

There are many sources of advice and tips for reading online information. The BBC Young Reporter website, aimed at pupils in KS3, includes some video clips of BBC journalists explaining how they check for fake news and sharing tips for checking what you read online. Pupils can also explore examples of fake news that have been identified by fact-checking organisations such as BBC Verify or FactCheck.org.

Older pupils might benefit from exploring more advanced fact-checking techniques, such as reverse image searching, which can help them to see if a photo that is being used on social media has previously been published elsewhere. This has been used to debunk claims about recent events. There is a short video guide to using reverse image search on Google for fact-checking images.

There are also a number of websites designed to include false information so that pupils can explore and critique them in a safer environment. All About Explorers consists of historical profiles of famous explorers such as Francis Drake and Christopher Columbus. The profiles are riddled with inaccuracies, which vary from obvious anachronisms to subtle mistakes. Pupils are encouraged to use other websites with more reliable information to fact-check the All About Explorers profiles. The website of the Pacific Northwest Tree Octopus is a detailed spoof website with information about a fictional creature. Multiple academic papers have shown that many readers are unable to correctly identify that the site is a hoax, including undergraduates (Unger and Rollins, 2021) and school children (Loos, Ivan and Leu, 2018).

Figure 1. A Pacific Northwest Octopus, generated using Midjourney (2025)

Pre-bunking

While being able to fact-check and debunk inaccurate information is an important skill and crucial for making proportional and balanced judgments about what is read, it is also important to recognise the ways that social media can be used to manipulate the reader, for example, by appealing to our emotions.

'Pre-bunking' is a term given to attempts to prepare audiences to recognise and resist misinformation and disinformation before it is seen. Usually, pre-bunking focuses more on the techniques used to manipulate the reader rather than the content itself. It aims to help readers to become more alert to instances of manipulation, rather than directly challenging

falsehoods. Harjani *et al.* (2022) identify a number of common misinformation techniques, including impersonating individuals or organisations, using strong emotional language, exaggerating differences between groups, encouraging conspiracies, targeting an individual instead of their argument, creating false dichotomies between positions and presenting arguments as falsely balanced when one side has much more evidence supporting it.

Pupils can be introduced to these manipulation techniques and shown examples of how they are used online. There is, for example, a series of short, animated videos explaining some of the most commonly used manipulation techniques such as scapegoating or false dichotomies. Older learners can also explore how social media is used in manipulative ways through games. In the game Bad News, players take on the role of a "disinformation and fake news tycoon." They make decisions about what to publish in order to get a balance between growing the number of followers while maintaining some level of credibility. The game takes around 20 minutes to play and was designed for over 14s. During the game, the players learn about techniques such as deliberate use of emotional content, impersonation, polarisation, trolling, discrediting opponents and conspiracy theories.

Harmony Square is another game where the players take on the role of the manipulator. They act as 'chief disinformation officer' and try to mislead a community to create division and tension. Aimed at players aged 15 and over, the game teaches about social media manipulation techniques and helps players to learn how to spot these. A teacher's guide is available.

By pre-bunking misinformation and disinformation, we can try to prepare pupils to make more reasonable decisions about what they see online. It can help them to recognise when messages are framed in ways designed to have an emotional impact and to take this into account when making judgements about the proportionality or balance of information.

Conclusion

This article has called for the development of reasonableness in the digital literacy classroom. We have suggested a small range of approaches that you could draw from when starting to develop your practice in this area. There is a range of resources that can support learning; however, it is often the dialogue in the classroom that surrounds these resources that is most important in terms of developing reasonableness.

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Chris has a range of research interests relating to technology, computing and digital literacy in schools and universities. He has published several articles about teachers' thinking about technology in higher education. His recent work has explored the pedagogy of teaching computing, teacher beliefs and knowledge about technology, and the curriculum.

An exploration of the potential which artificial intelligence has in supporting children's learning

Lorna Robinson

The image of a classroom without a single teacher present feels almost unthinkable, yet reports of lessons delivered entirely by AI make it clear that this is no longer just science fiction. While reading about such examples sparked my interest, what truly shaped my thinking were moments in my own classroom where I experimented with AI in small ways, such as using a tool to generate practice questions tailored to my pupils' needs or turning to a translation app to bridge communication gaps with a new student. For some, AI represents an exciting vision of personalised, data-driven education; for others, it is a worrying step towards a depersonalised, automated future. As a student teacher, these encounters compelled me to investigate not only whether AI could replicate the functions of a teacher, but also what might be lost when the human element is removed. In doing so, I discovered that the real conversation is less about replacing teachers and more about redefining how AI can work alongside them to enrich children's learning.

The appeal of AI in education

AI in education is not a brand-new phenomenon. For more than a decade, systems have been used to adapt tasks to children's needs, track progress and offer immediate feedback (Luckin, 2023). What is new is how sophisticated and integrated these tools have become. The London school I read about claimed their AI could learn from students, identify their strengths and weaknesses and deliver perfectly tailored lessons. Advocates argue this creates a highly personalised learning experience (Carroll and Borycz, 2024), something traditional classrooms, with their fixed timetables and mixed-ability groups, often struggle to provide. I can see why it is tempting. Imagine a child struggling with fractions getting extra targeted practice instantly, or another child racing ahead in science and receiving advanced challenges that day. AI can make that happen at speed and on a large scale.

The human element can't be ignored

However, education is more than delivering the right content. Children also need connection, encouragement and a sense that someone understands them. We learned this the hard way during the COVID-19 pandemic, when isolated online learning had a damaging effect on children's wellbeing (Worth, 2021). Even the most advanced AI cannot notice the subtle signs of anxiety, celebrate a breakthrough with genuine warmth or navigate the social complexities of the playground. Luckin (2016) is clear: AI should complement human intelligence, not replace it. For me, this is the crucial point – AI is a tool, not a substitute for the human relationships that drive learning.

How AI is already supporting children's learning

While the teacherless classroom is still rare, AI is already influencing education in more blended ways:

- **Adaptive learning platforms** like Times Tables Rock Stars personalise maths practice, keeping it fun and competitive while improving fluency.
- **Reading programs** such as Nessy adapt to support children with dyslexia, offering personalised pathways and building independence.
- In Sweden, **AI-driven robots** have been trialled in classrooms to answer questions and encourage participation, without removing the teacher entirely (Serholt and Barendregt, 2016).

These examples show how AI can boost engagement, support children with special educational needs and free up teachers' time for more targeted interactions.

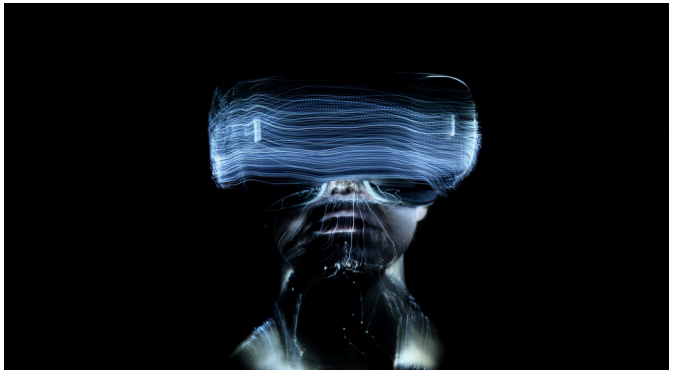

Figure 1. Crossver

The risk of trusting AI too much

One challenge that kept appearing in my research was AI hallucination, when a system generates confident sounding but incorrect information. For adults, spotting these mistakes can be hard; for children, it is even trickier, especially when many already believe "technology is always right." This is why developing digital literacy is essential. Luckin *et al.* (2016) argue that students need to be equipped with critical thinking skills so they can evaluate AI outputs. A practical classroom approach might be to ask AI questions with known false answers, then analyse its responses together. By building healthy scepticism, we prepare children to use AI wisely.

AI as a support for teachers

AI is not just for students; it can also help teachers themselves. Many face heavy workloads and administrative pressures (Ofsted, 2019; NEU, 2024). AI can draft lesson plans, generate differentiated activities, mark quizzes and help with assessment. However, these benefits come with responsibilities. Teachers need training to use AI effectively, including how to write prompts, check outputs for accuracy and protect pupil data (DfE, 2023). Without this, the risk of misuse or ethical breaches increases.

My perspective as a future teacher

After immersing myself in this topic, I believe AI has the potential to enhance learning, but not as a complete replacement for teachers. The London school's experiment might suit certain learners, but for most, a blended approach is best. AI can handle personalisation, instant feedback and certain admin, leaving teachers free to focus on emotional support, critical thinking and inspiring curiosity. Luckin (2023) describes AI's role as empowering students to become self-regulated learners: children who take ownership of their learning, think independently and adapt to challenges. That, for me, is the ideal goal.

Moving forward

Exploring AI's role in education has shifted my perspective. I no longer see it as something to fear but as a tool that, if used thoughtfully and ethically, could transform teaching and learning. Technology will continue to evolve, but it is up to us – teachers, researchers and policymakers – to shape its role in ways that align with our values. AI should serve education, not the other way around. However, in the meantime, it is my role as a teacher to continue engaging with and exploring the multifaceted elements of AI education, approaching its integration with informed curiosity and a commitment to student welfare.

Figure 2. Two heads

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Towards a digital skills framework for England

Gavin Davenport, FRSA; Ass. Prof. Andy Connell, SFHEA; Dr. Christina Preston; Alan Crist

Despite the growing centrality of a broad set of digital competencies in modern life, England lacks a coherent, age-appropriate digital skills framework for pupils aged 3–18. Although there is an awareness of a digital skills gap, an urgent need for media literacy and "an appetite from government and industry to address it" (Princes Trust, 2024), it remains unaddressed. This has led to fragmented provision, inconsistent expectations across schools and a widening digital divide, particularly affecting already disadvantaged learners. The persistent "digital natives" (Prensky, 2001) myth has led to false assumptions about the capabilities of young people. Despite computing being part of England's national curriculum for over a decade, many young people finish school without digital qualifications, and a significant digital skills gap persists in the UK workforce (British Computer Society [BCS], 2023). These issues are compounded when social disadvantage and gender factors are considered.

While some local authorities (e.g., Doncaster, Greater Manchester) have implemented interventions to reduce 'not in education, employment or training (NEET)' rates through digital upskilling, these remain uneven and reactive rather than systematic on a national level. Simultaneously, employers are exerting pressure on the education system to produce digitally fluent graduates. Over 80% of UK jobs now require digital skills (Lloyds Bank, 2024), yet nearly one in five adults lack the foundational capabilities needed for the workplace.

Though Wales, Scotland and Northern Ireland have all taken steps to embed the skills necessary for digital work, creativity and digital citizenship within their education system, England currently lacks any comprehensive framework for developing essential digital skills (Boeskens and Meyer, 2025). Such a framework needs to be broad, adaptable and integrated across all learning and professional contexts. Currently, England's computing curriculum emphasises computer science, programming and theoretical knowledge, which often does not adequately support young people with broader digital skills. Though the Curriculum and Assessment Review (CAR) (Department for Education [DfE], 2025) suggests a reemphasis of digital and media literacy through computing education, it still lacks a coherent framework.

To address this, we propose the development of a single context-independent framework for digital skills education and assessment, designed to address fragmented provision and evolving technological demands within the educational landscape in England. Against a backdrop of curriculum and qualification reform, rapid AI integration and waning support for computing education infrastructure, we argue for a child-centered approach to embedding essential digital competencies across all subjects and age phases (3–18) and into adulthood.

Emphasising transferable skills and an understanding of underlying principles, a hypothetical framework would prioritise developmental appropriateness, equity and agency before economic imperatives. It positions digital skills not as a subset of computing education but as a foundation to contemporary learning, civic participation and lifelong opportunity.

Key issues

The development of digital competencies in England has tended to take one of two routes. Firstly, a 'use case' model in the instance of the pre-2014 information computer technology (ICT) curriculum, which used technologies but often left them "black boxed and naturalised" (Edwards, 2015), enabling pupils to learn the case-by-case operation of software and hardware without examining the underlying theories and mechanisms. Secondly, a 'theory first' model of the computing curriculum, which seeks to "lead with concepts" (National Centre for Computing Education [NCCE], 2023). This falls down when pupils' developing real-world experience diverges from the pacing of the curriculum. This damages relevance and ignores the presence of a parallel, hidden curriculum deeply influenced by issues of digital (in)equity.

Instead, a holistic model supported but not driven by industry should be developed, which considers young people's diverse starting points and avoids technologies being 'taken for granted'. It should acknowledge that young people require these skills not simply for 'digital careers', but because all careers are digital and the world is increasingly digitised.

Curriculum focus vs. broader digital literacy

While computing is a statutory subject in maintained schools in England, since 2014, the emphasis within the English national curriculum has been firmly targeted at addressing real and perceived deficiencies in the understanding of computer science. Allocation of funding and focus of research have followed this, perhaps impacted by a desire to distance the teaching profession from the former ICT curriculum (Kemp *et al.*, 2024).

Investment in computing curriculum development and research has sought to drive engagement with GCSE computer science, itself linked to a perceived need for the 'coders of the future'. This GCSE qualification has been characterised as too difficult and discouraging of participation, particularly for female pupils (Kemp *et al.*, 2024; Royal Society, 2025). Proposals to introduce alternative qualifications, for example a vocational V level (announced in October 2025), whose indicative themes include 'digital' and a call for a creative computing GCSE, are laudable but require a coherent underpinning before age 16 to provide equitable access.

This narrowed focus means that young people may not gain the broader essential digital skills required for everyday life and the modern workplace. For instance, the Raspberry Pi Foundation (Arthur, 2025) notes that even where GCSE computer science is offered, only a fraction of students opt to study it, and its content does not support comprehensive digital skills.

There has been an enormous change in the use and nature of technologies, not least with the rapid uptake of AI since 2022. Conversations around curriculum have focused on 'knowledge', leading to a neglect of skills education and a lack of critical examination of how the underlying digital skillset has shifted and continues to evolve. A new emphasis on AI in education and the reduction of funding to key organisations like the NCCE in 2025, alongside an ongoing review of the national curriculum for England, present a moment of opportunity to consider the place of digital skills in contemporary contexts.

The pervasive digital skills gap

There is a significant digital skills gap in the UK workforce, with 36% lacking essential digital skills for work (BCS, 2023). Research indicates that only 35% of people not in work can complete all 20 work tasks required for employment, while 82% of jobs demand digital skills (Lloyds Bank, 2024). This gap impedes individuals' ability to secure jobs and affects the UK's competitiveness and productivity. However, it should be borne in mind that we are addressing first and foremost the needs of *children*, not future productive economic units.

Drawing on the work of the Digital Futures Commission (Livingstone *et al.*, 2025), it is evident that embedding children's rights into digital design, the implementation of technologies in schools and digital education is both necessary and achievable. Their findings highlight an urgent need for a child-centered approach to digital education, rather than one driven purely by economic necessity or the interests of technology providers.

The development of a skills framework should safeguard privacy, promote agency and ensure equitable access to opportunity both during formal education and beyond. The Commission's Blueprint for Education Data and Playful by Design frameworks underscore the importance of designing digital experiences that are developmentally appropriate, inclusive and respectful of children's evolving capacities.

These insights reinforce the call for a national digital skills framework for children and young people that is not only context-independent but also grounded in ethical, rights-based principles.

Lack of unified framework for skills

The BCS (2023) suggests a need for a "high-level framework for reviewing … approaches to digital literacy education" that provides a "cross UK [sic] view on the essential knowledge, skills and attitudes that make up digital literacy". This cross-UK approach is challenged by England's lack of engagement with digital skills.

Any new digital framework in England must be carefully aligned with the existing computing curriculum but remain distinct from it. To realise the broader ambition of using digital skills across all subjects, the framework cannot be confined to a single discipline such as computing. It is essential that it provides young people with opportunities to apply these skills to enhance their learning in all areas of the curriculum. This requires buy-in across subjects by subject leaders in schools and subject bodies, as well as the creators of popular schemes of work. Though the CAR begins to acknowledge this, the bulk of responsibility is proposed to remain within the computing curriculum.

However, research (DFE, 2024; National Foundation For Educational Research [NFER], 2025) indicates that teachers already feel the curriculum is overcrowded. For any digital framework to be successfully adopted, it must lead to improved student outcomes without increasing teacher workload or the time required for the preparation, delivery or completion of tasks.

Increased need for media literacy in response to AI

A number of reports have highlighted social issues arising from existing poor media literacy and the lack of critical media/digital literacy in young people (House of Lords, 2025; Prince's Trust, 2024; National Literacy Trust, 2018), with the House of Lords Democracy and Digital Technologies Committee warning of a "pandemic of misinformation and disinformation". They went on to recommend that media literacy should be fully embedded within the national curriculum.

With the recent rapid surge in AI applications, the need for media and information literacy has only increased, but we argue it must be delivered holistically, with full acknowledgement that existing barriers to digital confidence (equity, access, exclusion) exacerbate issues of low media literacy. Media literacy is often not done in schools. This may be the result of the basic levels of criticality and digital literacy within the teaching profession. A broad approach to developing critical digital literacies, which encompass traditional and AI media, is essential for teachers and pupils.

Proposed solutions

To address these challenges, we propose the development of a context-independent, child-centred digital skills framework – one that is adaptable across subjects, scalable across age groups and aligned with both civic participation (digital citizenship) and workforce readiness (digital work), as well as a broader creative element (digital making). This framework should emphasise transferable competencies, such as problem-solving, safe online communication and media literacy, while allowing for local flexibility and innovation. Embedding these skills into the curriculum from early years through to post-16 education can ensure that all young people in England are equipped to thrive in a digitally mediated world. This proposed framework cannot remain a sub-strand or pillar of computing education, nor can it be solely addressed by post-16 routes; instead, it should be considered an essential element of education itself with benefits and implications throughout the curriculum.

This framework would:

- **Define broad competencies:** embrace a definition of digital skills competency that encompasses the ability to access, manage, understand, integrate, communicate, evaluate and create information safely and appropriately through digital technologies for various aspects of life and work. This definition should include not just knowledge and skills but also attitudes and dispositions.

- **Integrate across the curriculum:** digital skills should be placed at the heart of all learning, not confined to a single subject area like technology or computing. They must be championed and embedded by the relevant subject associations and curriculum bodies. Rather than confining digital skills to a standalone technology or computing class, these expert bodies are best placed to interpret the core digital literacy skills and situate the necessary competencies within the context of their own disciplines.

- **Incorporate computational thinking:** explicitly include computational thinking and logic as key problem-solving skills, distinct from traditional programming, to develop complex problem-solving competencies and a broader understanding of instructing computers.

- **Address ethical and societal issues:** the framework should equip learners to understand the positive and negative social and environmental impacts of science and technology including ethical and societal issues of AI, digital security and safety, privacy and environmental impact.

It is unlikely that separate frameworks for media literacy, AI literacy and digital literacy would be delivered with fidelity across all schools, and a single coherent framework which addresses all of these stands a greater chance of succeeding. We acknowledge the risk of frameworks of this type (e.g., the former incarnation of 'citizenship'), which sit alongside statutory curricula, being implemented inconsistently. We also acknowledge the worry this may cause in terms of perceived additional teacher workload. However, it would be a disservice to the young people of England and an economic mistake to miss this opportunity to address a clear gap in the curriculum.

Figure 1. TPEA 37th Annual Conference 2025 in York

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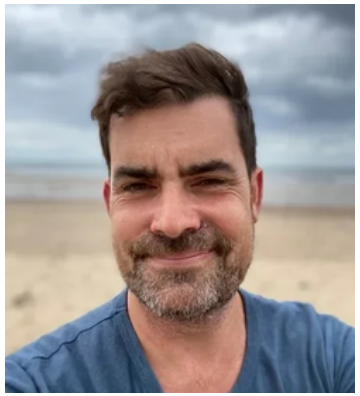

Gavin Davenport

Gavin Davenport spent seven years writing and designing video games for the likes of Atari before retraining as a primary teacher. He has taught in English primary schools for 18 years, alongside educational project management for a range of cultural charities and winning national awards for digital resource design. He has been a computing lead teacher in several schools and across a large multi-academy trust in the North West, becoming a National Centre for Computing Education Senior PDL in 2023. He now lectures in primary education at Edge Hill University in Lancashire, leading computing across several courses and training routes.

Gavin is a Fellow of the Royal Society of Arts (FRSA), a doctoral researcher at Liverpool John Moores University exploring the capital of digital literacy and subject specialism, and has recently led a wide-ranging commercial research project investigating the landscape of computing in primary initial teacher education. He has worked as a consultant with a number of trusts and school partners on the improvement of primary computing and on addressing the digital divide during COVID-19. Gavin's interests lie in technology as a lever for social change and equity, and as a tool for creativity.

Ass. Prof. Andy Connell

Andy Connell is Associate Professor and Head of Group (Education) and Continuing Professional Development (CPD) at the University Centre, Shrewsbury (UCS), part of the University of Chester. He leads education courses at UCS and CPD for teachers. Until January 2019, he was Head of Initial Teacher Education at the University of Chester. He has been on a number of national subject expert groups for computing and ICT, including drafting the Computing curriculum, Subject Knowledge Enhancement and Initial Teacher Education content, and on several advisory groups on teacher standards. He was previously subject lead for secondary Computing/IT at Keele University and Liverpool Hope University. Before moving into higher education, he was a teacher and head of computing and business in secondary schools, and also taught in primary schools.

Andy is Chair of the Council for Subject Associations. He is currently working closely with the British Council on promoting global and sustainability education across the curriculum in the UK. He is Treasurer for TPEA and a long-standing executive committee member of the Association for Information Technology in Teacher Education (ITTE).

Dr Christina Preston

Dr Christina Preston has been at the forefront of education, technology and innovation for over 25 years. The MirandaNet Fellowship, which she founded in 1992, has become a global thought leader in edtech, with over 1,200 members in 80 countries. Christina has won five international awards for education innovation and for building communities of practice.

A senior researcher at the Institute of Education, University College London (UCL), from 1992 and now an associate professor at De Montfort University, Christina has led several high-profile research projects and evaluations for UK government agencies and a range of organisations in Argentina, Chile, China, the Czech Republic, India, Mexico and South Africa as well as edtech companies.

Alan Crist

Alan Crist is a highly accomplished educational leader and curriculum specialist whose work bridges pedagogical research with practical, large-scale implementation. With a background in primary curriculum design, his expertise lies in the rigorous design and development of structured, progressive learning content and innovative curriculum frameworks. His research-informed approach to curriculum design has yielded significant, measurable impact.

As Director of Education at hi-impact Consultancy, Alan demonstrates strategic leadership in scaling educational technology, overseeing a team that delivers more than 700 days of technology-focused continuing professional development annually.

His extensive career across further, primary and secondary education provides him with a deep, holistic understanding of learner and teacher needs, ensuring his work is consistently grounded in effective pedagogy and robust educational theory.

Let's think before we leap: will adding AI really help teachers and students?

Alison Hramiak

Crashed into school time
faced contact dies. AI
survives. Fixed in time.

Just how much more can we add to the school curriculum? To the school day? How much more responsibility can we keep giving teachers? Should they be responsible for teaching children how to behave ("No shoes on the desks, please!") or how to eat ("Don't use your fork like a shovel!", "Please close your mouth when you eat!", "Don't throw food onto the floor at break time!" – oh yes, I worked in that school for a year. Very unpleasant.)? Or how about asking schools to make sure that your children are not aggressive towards others that are different, to make sure that your children are tolerant, respectful and courteous? Or make sure that they are out of nappies, know how to climb stairs and take part in a conversation rather than just wait to be told all the time? I'm not making this up – I did some research.

Need I go on? ("Please don't, Alison," I hear you say, "we've had enough of your rants for one day."). I won't. I'll stop there. Schools should be responsible for the above (arguably) but more as a support mechanism, a reinforcement of what a child's parents or guardians have already instilled into them. Shouldn't they? And if you keep on adding to the curriculum and to the school day, with things that really ought to be introduced and taught at home, what comes out to make room for these things?

I'm not expecting an answer; there's a whole load of rethinking the structure and purpose of education and schools if we go down that route. I'm using this as a way of leading into the topic of the use of AI and technology in schools to save teachers' time, which is currently in the media (see use of AI in schools). The supporters of this idea/policy/latest trend (delete at will) wax lyrically about how the use of AI and mobile technology in classrooms (phones, tablets and so on — you know, all the things we're trying to get children to spend less time on by having to have providers turn off the internet for us at bedtimes…) will save teachers' time, time that they can then spend on other, more important things. What these other, more important things are, I never really got a sense of. I'm not sure what is more important than prepping and planning and then doing your lesson. But I may be wrong, and if I am, I'm sure someone will tell me.

In response to this, there have been reactions from renowned, intelligent and respected people from universities and schools in the media lately (week of 21st July, when I first started writing this), expressing their concern about the lack of appropriate evidence to support any of the proposed positives and advising caution when implementing such wholesale use of technology in schools.

None of this is new. Just google – other search engines are available – 'technology in teachers' hands'. There's a whole raft of advice, policy, government strategy, going back years on exactly this. But does it feel like we've actually learned anything? To me, it feels more like we've just added (again) to an already overburdened curriculum and an already overburdened workforce. A workforce who are now expected to implement new technologies in the hope of saving them time – once you've accounted for the time it takes for the teachers to be upskilled, trained and given practice time. And I can't be the only person wondering who is going to make money from this… (Have a look here, for example, Extramarks to reveal AI tools for teaching, learning).

We're now, and have been for some time, being told that we need to reduce time spent on technology. And, as I said earlier in this article, we even have TV adverts for internet providers who will assume the role of parents and take away the internet for you in the evening if you're unable to do it yourself. The above are just some examples of where there is a juxtaposition of more use of tech in schools vs. less use of tech for children and young adults. No wonder they get confused.

For me, through it all, as a seam, a thread that snakes through these 'good intentions' is the irony that as a society, we're already starting to see some of the downsides of a generation of people who prefer online communications, who prefer text to phone conversations and who prefer to spend time online rather than with each other in person. Again, I've done some research, and not just with my own 'children'. A professional educational psychologist told me that their research has shown that there's a generation of young people who now shy away from using a telephone and who don't have the confidence to make or take calls, preferring to stick to text. These young people must be taught how to make phone calls and how to speak to people on the phone. Texting all the time is great for when you're with your friends… not so good in the workplace as you get older, I'd argue. These are the same young people who may struggle socially as well as in the workplace when put in unfamiliar situations – ones that require actual human contact. We can blame Covid, but I'm not sure it's solely responsible.

"So, what now, Alison?" I hear you say. My view is that, like so many of my colleagues at TPEA, I think that we need to take stock, assess the situation and consider the whole issue of implementing this 'time-saving' technology before we go too far, spend a lot of money and can't then retrace our steps easily – a bit like Britain's new railway High Speed Two (HS2). Some specific, well-thought-out research would help to inform us better, as would some feasibility studies, maybe also asking teachers from all areas, from all parts of the UK (and not base the policy on research done in other countries!) what they think before we leap.

I don't think this discussion is going away any time soon, as it's too important, with far-reaching consequences if we don't get it right. Let's keep talking about this because by discussing it openly, we may just be able to make sure it's done well. Technology isn't a panacea, but if used well, it can enhance education – and for me, that is what it's best used for, after all.

Author

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Alison Hramiak is a poet, writer and tutor living and working in West Yorkshire, England. She is published in several Forward Poetry anthologies, New Contexts 4, 6 and 7 and on various poetry websites such as Impspired and The Causley Trust. She edits and reviews poetry anthologies and is a member of several poetry groups, such as Consilience. She blogs for the Sheffield Institute of Education. Her work can be found at Poetry for Lives. Her poem featured in this article is published in Fulcrum Issue 2.

Practitioner Tips

Dr Christina Preston

Bridging worlds with language: how one educator is using tech to transform learning for refugee students

An interview with Dr Candy O. Vitale, Robotel Canada
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Candy O. Vitale is a Spanish American who is helping to develop Robotel, a digital language platform. Robotel was founded in 1984 in Canada by two engineers, Étienne Bouchard and François Larochelle. The company originally started as a robotics project aimed at creating point-of-sale robots for retail stores. Shortly after, it pivoted to educational technology when the Québec school system began introducing personal computers and needed classroom management solutions. This led to the development of Robotel's first product, Microselect, and eventually its flagship platform, SmartClass, which is now used globally for language teaching.

When I interviewed Candy, I was impressed with her enthusiasm for young learners who have been displaced from their country of birth. In fact, it is her own journey through life that has contributed to the deep understanding about learning new languages that is at the core of her development of Robotel.

She introduced herself as "a true and tried Jerseyite," born in New Jersey to Spanish parents. Candy grew up bilingual, speaking English outside and Spanish at home. That duality shaped not only her identity but also her professional mission, which she explains is to make language learning accessible, personal and powerful, especially for students who need it most.

Today, Candy works in both development and regional sales for Robotel, an edtech company offering an innovative language acquisition platform. She also serves as the company's pedagogical coach. This role allows her to merge her linguistic expertise with technology to improve classroom outcomes.

But her journey didn't start in the boardroom. It started with cassette tapes! "When I first started teaching, the language lab used cassettes. It was slow, very analog — but it worked. I was fascinated by how even simple tech could immerse students in a language they'd never heard before."

That curiosity led her to experiment early. From PowerPoint and clip art to early podcasts downloaded in Spanish, Candy constantly searched for ways to make language learning more authentic and empathetic: "I was always trying to give students something organic, not a dull routine. I'd bring in real Spanish conversations, real accents, even if it meant jumping across continents."

Eventually, Candy discovered Robotel, a digital language platform that offered far more than audio lessons. It included dual-screen setups for teachers, headsets for live interaction and, most importantly, tools to adapt instruction for each learner. Today, Candy helps Robotel evolve. She supports teachers worldwide in integrating technology into lessons without replacing the educator. "Tech shouldn't replace teachers," she says, "it should help them meet every student where they are. That's the real art of the process."

Figure 1. Robotel logo (Robotel, 2025)

Tech meets human need

Robotel now offers full English, Spanish, German and Arabic language curricula. But its real strength lies in adaptability. Teachers can create custom content in any language, from Hebrew to healthcare-specific English, using over 18 activity templates tied to the four core domains: reading, writing, speaking and listening. “There’s academic language in every profession from finance to plumbing to medicine. A second-language learner doesn’t just need vocabulary; they need the right language to survive and thrive.”

That’s especially relevant in the UK, where Robotel is now being piloted in several multi-academy trusts. Many of the students using the platform are refugees, children with interrupted schooling and those with limited English. Using Robotel, they can access content meant for their age group in a new language and culture. “For example, you might have a child expected to learn secondary science in English, but they have such gaps in their school attendance, and anyway they would have been learning science in their native language. It’s very hard for this child.”

Robotel’s tools offer a way in. Through pronunciation practice graded by AI, guided conversations and tailored language content, the platform meets learners at their level culturally, academically and emotionally.

Language as identity, not obstacle

Candy is adamant that immigrant children shouldn’t have to leave their native language at the door: “You don’t strip a student’s identity to teach them English. That’s not how real learning works. You build bridges and help them make connections between what they know and what they’re learning.”

The platform allows teachers to do just that. They can upload their own voices, local accents and family conversations. They can even create cultural context that helps students relate. That nuance matters. “My students would hear my Spanish accent, then get exposure to Argentinian or Mexican Spanish during assessments. Language is lived, and it sounds different everywhere.”

In English, the platform adapts too. Teachers can customise vocabulary, accents, even slang, from “math to maths” and “sidewalk to pavement”. In this way, students hear the real world, not just textbook phrases.

Figure 2. Key features of the SmartClass Language Lab (Robotel, 2025)

From ESL to STEM: a platform that grows with learners

Robotel’s reach goes beyond language classes. Teachers are now creating modules for science, math and social studies, using the platform to scaffold academic vocabulary and subject-specific discourse. “No one walks around saying, ‘What’s the plot and argument of that story?’ But in school, you have to. We help students, even native speakers, to learn that academic language.”

It also helps students grasp AI-driven, digital-first terms used in real life. “Sixth formers may not speak science fluently,” Candy says, “but they can talk tech. This tool helps bridge that gap too.” Looking ahead, Robotel is developing a third layer: graded pronunciation exercises with instant AI feedback. Students listen, mimic, record and improve using visual prompts and guided AI interactions.

Figure 3. SmartClass for students (Robotel, 2025)

A tool with a mission

Candy's passion is clear: this isn't just edtech. It's about equity, belonging and breaking barriers through language. That's why she's excited by the platform's growing presence in the UK and hopeful about its future impact. "Governments may demand fluency from immigrants. But we need tools that recognise where students come from, what they've survived, and what they need to move forward."

And for educators like Candy, that mission is personal. Whether it's a podcast from Spain, an AI conversation about Broadway or a language module for respiratory therapists, it all comes back to one goal: helping students be seen, heard and understood in every language they speak.

Candy's most important message for teachers is that this new language teaching medium is not just a means of understanding what is being said but also a way of relating to other nations and cultures with understanding and empathy. With this underlying message, Robotel offers teachers a new approach to language learning and a way for learners to understand the intricacies of living in new communities.

References

Demers, Y. (2024) *Robotel Inc. celebrates 40 Years of pioneering innovation in language education*. Available at: https://www.robotel.com/en/blog/robotel-inc.-celebrates-40-years-of-pioneering-innovation-in-language-education (Accessed: 8 December 2025).

Robotel (n.d.) *We believe in transforming how languages are taught*. Available at: https://cdn2.hubspot.net/hubfs/6118923/Robotel_December2019%20Theme/pdf/SmartClass-Corporate-Profile-EN.pdf (Accessed: 8 December 2025).

Recommended reads

Book review: *Reimagining teacher digital competence* by Alison Egan, Keith Johnston and Oliver McGarr

Reimagining digital competence is a timely text in the current climate of assessment and curriculum review. Set out in ten chapters, this book approaches ethical dilemmas raised by professional digital competence demands. By using case studies throughout, it gives examples of what digital competence could and does look like in practice and identifies debates for readers to consider in their context.

The underpinning message in this book for me was "staying true to pedagogical values" (p. 6). The value placed on teacher autonomy to know what is best in their setting is fundamental. The book begins by offering a way of viewing digital competence that moves practitioners away from viewing this as a narrowly focussed set of skills and competencies that make you a digitally competent teacher – for now. Instead, the opening question that frames the issues raised throughout the book is, "What is a competent teacher in the digital age?" (p. 31). This effectively frames the range of ethical challenges raised in the following chapters. The authors take a future-focussed lens to consider what teachers' digital competence needs might be as we move forward through an era of rapid technological development and educational reform.

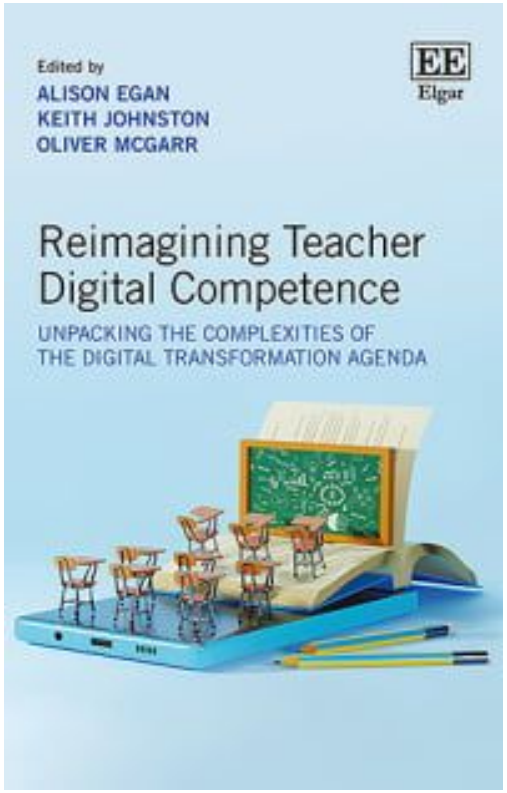
The authors challenge the readers to consider what digital competence might look like in terms of teachers' knowledge, preparedness and ability to respond to changes. They warn against prioritising technological knowledge over critical considerations of its complexities and drawbacks. The focus on teacher professional identity through a digital competence lens in Chapter 3, for me, is very powerful in supporting teachers to navigate this journey. Having agency to make decisions about the effective use of technology in their settings and understanding how their professional identity, formed from their values and beliefs, can impact their own feelings of digital competence, is crucial. The authors emphasise the important role of initial teacher education in supporting the formation of a professional teacher identity that considers digital competence.

Critical use and consideration are encouraged through discussions around how teachers can keep children safe online, and that part of being digitally competent is understanding the complex legal responsibilities as well as technology-related issues such as cyberbullying, wellbeing and digital addiction. The book challenges the assumption that technology is inherently positive and raises the challenge of digital poverty, where use of technology can indeed widen the gap in equality and inclusion. This social justice lens encourages the reader to consider the diverse needs of their context in relation to equitable access, understanding and use of technology. This critical digital literacy consideration further reinforces the need to have strong underlying pedagogical reasons to use technology for the benefit of learning.

In Chapter 7, the authors delve into the sustainability challenges raised by digital acceleration, including the making, using and disposal of devices, which often cause significant wastage and power usage. Digitally competent teachers are aware of these challenges and their impact on the lives of others. Being aware of and speaking about ethical issues with students, colleagues and student teachers further develops digital agency and supports them to take a reflective approach to their own digital practices, which appear throughout the book (wellbeing, mental health, equity, sustainability). The challenges of AI are raised, and the discussions around intellectual property, contract cheating and academic integrity make the reader consider how these impact upon their own practice, and that digitally competent teachers can respond critically to these evolving challenges.

In summary, this book aims to empower teachers to respond to digital transformation. It centres ethics and teacher agency as central to digital competence and encourages the reader to consider more broadly the robust and comprehensive base of knowledge that makes one digitally competent.

The book is a thought-provoking piece that will make a superb addition to any initial teacher education programme, providing debates that would complement any professional studies or curriculum modules. Similarly, school leaders, subject leaders and teachers would find the wider debates around their own practice and what digital competence might look like in their disciplines or settings.



Reimagining teacher digital competence (Edward Elgar Publishing, 2024)

Author

Dr Emma Whewell

Dr Emma Whewell is associate professor of Learning and Teaching at the University of Northampton. She is co-lead for the research centre for Active Digital Education and an executive board member for TPEA.

Trends and topics in educational technology

Educators and researchers Dr Cristina Costa and Dr Michaela Oliver at Durham University have launched the Digital Literacies Network: an exciting new online space dedicated to promoting safe, ethical and inclusive digital engagement.

The website serves as a hub for research-informed teaching resources, reports and their academic writings, designed to inspire and support teachers, community educators, youth workers, parents, researchers and policymakers committed to advancing digital inclusion.
At the heart of the Digital Literacies Network lies a clear vision: to empower individuals and communities to think critically about technology while harnessing its potential for human flourishing.

The initiative rests on three key actions and values:
1) fostering **critical** awareness of how power operates in digital spaces,
2) nurturing **hope** and creativity in the face of technological change and
3) providing **practical** resources for ethical and safe digital engagement.

From media literacy and digital wellbeing to questions of identity, belonging and inclusion, the Digital Literacies Network offers guidance and reflection for anyone seeking to navigate our increasingly digital world with confidence and care. The freely available resources were created with the aim of fostering empowerment, and the majority were co-produced with research participants to ensure they resonate with the audience they are focused on.

Visit the Digital Literacies Network to explore our mission, access resources and/or suggest collaborative ventures focused on a more just, creative and connected digital future. We would love to hear from you.

Dr Cristina Costa and Dr Michaela Oliver

Our resources (Digital Literacies Network, n.d.)

Authors

Dr Cristina Costa

Dr Cristina Costa is associate professor in the School of Education at Durham University, where she also serves as co-director of the Durham Research Methods Centre. Her research focuses on the intersections of digital experiences and societal phenomena, with implications for education through various social theory lenses. She is currently working on projects related to digital well-being, generative AI in education and theory as a method. Cristina is also a research fellow with Durham County Council and a visiting scholar with the European Commission Joint Research Centre: Directorate T – Digital Transformation and Data Digital Economy.

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Dr Michaela Oliver

Dr Michaela Oliver is assistant professor in the School of Education at Durham University and associate executive dean for education in the Faculty of Social Sciences. Her research focuses on issues related to digital education, literacies and citizenship. She is particularly interested in discipline-specific reasoning practices and explores how to promote reasoning in educational settings. The roles of pedagogical task design, dialogic and collaborative teaching and learning approaches are considered in relation to the promotion of reasoning about complex digital issues.

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DMU professor addresses AI in education at UNESCO

A professor from De Montfort University (DMU) Leicester has spoken about the threats and opportunities that AI brings for teachers and teaching at a high-level event run by UNESCO.

Dr Sarah Younie, Professor of Education Innovation at DMU, addressed UNESCO's Digital Learning Week in Paris to co-present a new position paper on AI in teaching from the Teacher Task Force (TTF) of which she is part.

Professor Younie, who is editor-in-chief of the international research journal *Technology, Pedagogy and Education* and elected global chair of the International Council on Education for Teaching (ICET), spoke at UNESCO alongside April Williamson of Digital Promise, a Washington-based not-for-profit organisation backed by the Gates Foundation and the US Government.

Together they presented the position paper 'Promoting and protecting teacher agency in the age of artificial intelligence', which explores how AI can be integrated into education equitably and ethically while preserving teacher agency.

Professor Younie said: “This is a fast-changing space where AI is potentially changing the role of teachers, and we have to ask how we can protect them because that’s important, but we also need to look at the educational opportunities that AI can undoubtedly offer.”

“These are such important questions; will AI lead to a decline in thinking practises? Will it dehumanise education? Will we have teacherless schools?”

“One of the key points is that there needs to be more research in this field and particularly more longitudinal studies in order to provide robust evidence on which to make decisions.”

The position paper itself recognises that AI has an important role in education but reaffirms that teaching is, and must remain, a fundamentally human and relational practice and that teachers must be empowered and placed at the centre.

The 36-page document begins: “Artificial intelligence (AI) is reshaping the education landscape, yet its transformative potential will ultimately be defined by the people who design, implement, and mediate its use. Central to this human infrastructure are teachers, whose professional capacities and agency should be foregrounded in any AI integration strategy.”

Professor Younie and April Williamson worked on the paper as part of a team that included Mutlu Cukorova, Professor of Learning and Artificial Intelligence at University College London, and Carlos Vargas, Head of the Secretariat of the TTF.

Professor Younie was chosen because of her longstanding links with the TTF, as co-chair and founder member of the Education Futures Collaboration (EFC) and Mapping Education Specialist knowHow (MESH) project, which is an NGO member of the UNESCO-supported TTF.

Digital Learning Week was held at UNESCO’s Paris headquarters and was attended by 90 education ministers from around the world, including Steven Morgan MP, who at the time was the UK Government Minister for Early Education but has since moved to the position of Government Whip (Junior Lord of the Treasury).

Posted on Friday, 19 September 2025

Curriculum and assessment review

*I*n July 2024, the government commissioned Professor Becky Francis CBE to convene and chair a panel of experts to conduct the Curriculum and Assessment Review.

The government has considered the Review's recommendations and responded with a plan to secure an excellent education for every child and young person, raising aspirations and building a world-leading curriculum, assessment and qualifications system for all.

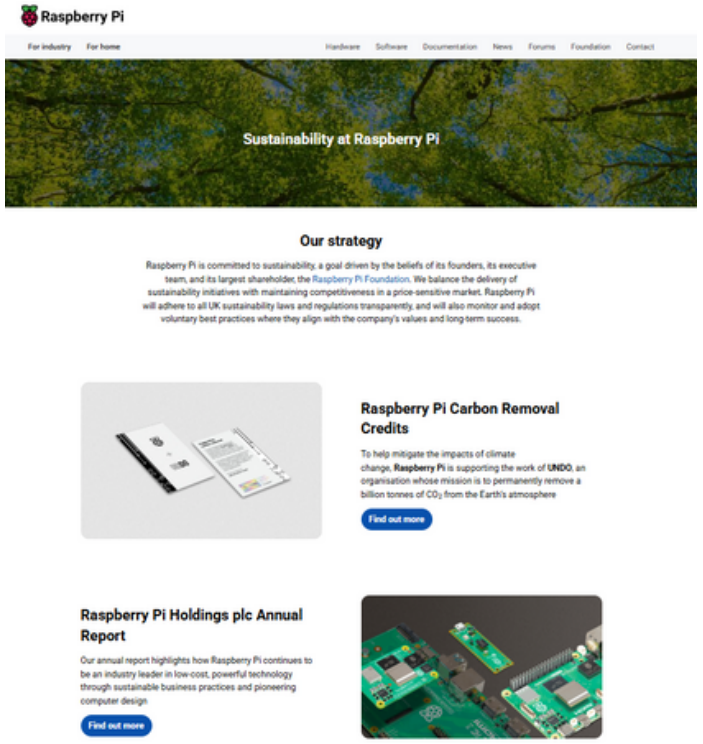
The final report draws on the views shared by these groups and sets out the Review's conclusions and recommendations.

- Curriculum and Assessment Review Final Report - GOV.UK (computing pp. 62–66)

- See Dr Elizabeth Hidson's (TPEA Chair) response to the final report: Technology, Pedagogy and Education Association: Response to the Curriculum and Assessment Review, November 2025 – Call for a Digital Skills Framework – TPEA

Raspberry Pi launch their sustainability portal

Raspberry Pi launch their sustainability portal: The new Raspberry Pi sustainability portal - Raspberry Pi



Sustainability at Raspberry Pi (Raspberry Pi, 2025)