Literature Review:
Digital Transformation and AI in Multi-Academy Trusts (MATs) 2022–2025

Executive Summary

Digital technology and AI are rapidly reshaping education, and Multi-Academy Trusts (MATs) in England are at a pivotal moment. This literature review synthesises research from 2022–2025, highlighting key strategies for MAT leaders to harness digital transformation and AI effectively, ethically, and in alignment with their educational vision.

Key Messages for MAT Leaders:

- **Strategic Alignment:** Any use of AI or EdTech must serve the trust's core purpose of improving student learning and wellbeing. A clear digital vision, complementary to the educational strategy, is essential.

- **Top-Down Leadership:** Strong leadership from CEOs and Boards is crucial to champion a trust-wide digital transformation strategy within a robust ethical framework.

- **Universal AI Literacy:** Significant investment in training and professional development is needed for all staff, from teachers to support personnel, to build AI awareness and competence. Students and parents also require education on AI.

- **Phased Implementation:** Start with small, safe pilot projects with clear goals and evaluation metrics. Scale successful initiatives across more schools or subjects iteratively, managing risk and maximising learning.

- **Ethics, Privacy, and Equity:** Prioritise these from day one. Conduct Data Protection Impact Assessments (DPIAs) for all new tools, ensure GDPR compliance, and address potential biases in AI systems. Proactively bridge the digital divide by ensuring equitable access to devices and connectivity.

- **AI to Enhance, Not Replace:** Emphasise that human judgment remains paramount. AI should augment teachers' capabilities and personalise student support, freeing educators for human-centric tasks like mentoring and creative instruction.

- **Assessment Redesign:** Update assessment policies to account for AI. Clearly communicate fair use of AI in coursework and exams, and redesign assessments to foster higher-order thinking, creativity, and real-world problem-solving, making them more "AI-resilient."

- **Monitor Impact and Iterate:** Treat digital transformation as an ongoing school improvement programme. Define and monitor Key Performance Indicators (KPIs) regularly to inform adjustments and ensure the strategy delivers value.

- **Collaboration and Knowledge Sharing:** Foster a culture of collaboration internally and externally. Share policies, training resources, and co-develop tools with other MATs, industry partners, and researchers to stay at the cutting edge.

- **Pedagogy and Inclusion:** Always bring the conversation back to teaching and students. Technology should serve pedagogical goals and ensure interventions are inclusive for all learners, including those with SEND or EAL.

Simplicity from complexity

Introduction

Multi-Academy Trusts (MATs) in England are navigating a period of rapid digital change, accelerated by the COVID-19 pandemic and the emergence of artificial intelligence (AI). Recent peer-reviewed research (2022–2025) highlights how MAT leaders are formulating digital transformation strategies, building AI literacy and capacity, and grappling with ethical, pedagogical, and workforce implications of AI adoption.

This literature review synthesises current findings on: (1) strategic digital transformation and leadership in MATs; (2) AI literacy, professional development, and capacity-building; (3) ethical governance, data privacy, and equitable AI use; (4) the role of EdTech platforms, learning analytics, and generative AI in school systems; and (5) practical frameworks for MAT-level implementation, including assessment redesign and digital governance. Insights from independent reports – **Shape of the Future (Big Education/School21, 2024) and PedTech in Practice: The Next Chapter** (EdTech Hub, 2024) – are integrated as real-world illustrations alongside academic evidence.

The aim is to draw out implications for MATs, informing leaders and boards on aligning technology with educational vision, safeguarding values, and improved outcomes.

Strategic Digital Transformation in Education and MAT Leadership

Defining Digital Transformation: Digital transformation (DT) in education refers to a holistic realignment of an organisation's strategy, culture, and operations enabled by digital innovation. Unlike incremental tech adoption, DT entails a "transformation mindset" that moves beyond siloed initiatives to systemic change. A 2023 review by McCarthy et al. defines DT for learning organisations as leveraging technology to enhance efficiency, stakeholder experiences, and agility in response to societal shifts. The COVID-19 pandemic underscored this need: education systems were forced to replace in-person schooling with online modalities virtually overnight, exposing both the potential and deficiencies in digital readiness. Pre-pandemic, OECD analyses warned that education lagged other sectors in digitalisation and risked widening gaps between what schools provide and societal demands. Post-2020, MATs face pressure to **"transcend siloed digital innovations and embrace a transformation mindset"** in order to remain resilient and effective.

Leadership and Vision: Research consistently identifies strong leadership as the cornerstone of successful digital transformation in schools. Effective transformations "begin with the right leader(s) in place" who can articulate a clear vision and purpose for change. Executive sponsorship at the trust level is crucial – MAT boards and CEOs must champion a holistic digital strategy that extends beyond IT departments and aligns with the trust's educational mission. Visionary leaders set a tone of proactive innovation rather than reactive adoption, communicating possibilities and a shared digital vision across the organisation. For example, McCarthy et al. highlight that only 20% of industry leaders operate with a truly proactive mindset, underscoring the need for creative, forward-thinking leadership in education.

Equally important is **culture**. Leaders must foster a culture of trust, collaboration, and openness to innovation. Digital transformation often requires breaking down silos and encouraging experimentation. In the education context, this means bringing together students, teachers, staff, parents, and governors around a well-communicated vision. Studies indicate that when leaders build **coherence** – a collective sense of purpose and clarity of roles – schools can more effectively leverage technology for deep learning and continuous improvement. Conversely, a risk-averse or siloed culture is a common barrier to digital innovation in MATs. A recent MAT sector study found that cultural resistance, lack of leadership capacity, and fear of change are among the barriers to both organisational growth and digital initiatives.

Strategic Planning and Investment: Translating vision into reality requires robust strategic planning and sustainable resourcing. All organisations studied by McCarthy et al. emphasised strategic and business planning as critical components of digital transformation. MATs must develop clear digital strategies that outline objectives, required investments in infrastructure, and phased implementation plans. Adequate funding for devices, platforms, and support personnel is needed to scale successful pilots into wider practice. Importantly, strategy should be treated as an evolving plan – digital transformation is not a one-off project but an ongoing process (often described as moving from "early" to "maturing" stages rather than a fixed end-state). A lack of strategy itself was identified as a barrier in MAT leaders' perceptions; trusts that attempt ad hoc tech adoption without an overarching plan often struggle to realise meaningful change.

Governance and Data Policy: With greater digitalisation comes greater responsibility for governance, risk management, and compliance. Leaders must put in place policies addressing data privacy, security, and ethical use of technology. Digital transformation dramatically increases the volume of data stored and transmitted (from student records to learning analytics), raising concerns about who has access, how data is used, and how it is protected. School systems carry legal duties of care for students, so issues like GDPR compliance, safeguarding, and intellectual property must be integral to any digital strategy. Trust leaders are called on to establish clear governance frameworks that define data ownership, vendor agreements, and accountability for digital tools. **The Shape of the Future** report (2024) echoes

this, recommending that MATs explicitly address governance, safeguarding, and ethical considerations in their AI strategies from the outset. This includes developing policies on AI usage (e.g. guidelines for staff and students on generative AI), vetting of EdTech vendors for compliance, and ongoing oversight via trust boards or digital committees.

Measurement and Impact: A theme in the literature is the importance of measuring the impact of digital initiatives. Effective leaders use data to "constantly communicate progress in a visible way" and adjust course as needed. In education, traditional metrics (student attainment, progress, engagement) remain paramount; however, new indicators are emerging to gauge digital transformation success. These include teacher adoption rates of new tools, reduction in administrative workload, improvements in digital skills, or enhanced student participation via technology. McCarthy et al. note that given the significant investment DT entails, leaders need to review **"stakeholder participation, performance of people, and feedback"** regularly to ensure the transformation is delivering value. MATs have begun developing digital maturity models – for example, the UK Department for Education (DfE) created a metric for "digital maturity" in schools to help trusts assess their progress and identify gaps. By setting Key Performance Indicators (KPIs) for their digital strategies (such as % of teaching hours using digital content, or pupil:device ratios), MATs can introduce accountability and celebrate quick wins to build momentum.

People and Change Management: Beyond technology, digital transformation is fundamentally about people. Studies emphasise talent development and empowerment as a core pillar, second only to leadership, for driving change. This involves investing in human capacity – training staff, recruiting digital expertise, and empowering educators and students to innovate. A synthesis of frameworks finds that **"attributes and skills"** were the most referenced "People" component in education system transformations. In practice, MATs must assess and build the digital competencies of their workforce. Without sufficient training and confidence, even well-funded tech initiatives can falter due to low teacher uptake or suboptimal use. Conversely, when educators are supported to develop new skills, they become change agents who can reimagine pedagogy with technology. Change management literature for schools highlights the need for inclusive communication, involving staff in decision-making, and addressing anxieties (e.g. fear of replacement by AI or concerns about workload increases). In summary, strategic leadership provides vision and structure, but it is the people – teachers, support staff, and students – who ultimately enact digital transformation.

AI Literacy and Capacity-Building in MATs

As AI tools rapidly enter the education landscape, **AI literacy** – the awareness, knowledge, and skills to use AI effectively and ethically – has become a critical capacity area for schools and trusts. Recent research and practical experiments underscore a **"pressing need for comprehensive AI awareness and literacy training for all stakeholders, including students, staff, families, and policymakers".** For MATs, this translates to system-wide efforts in professional development (CPD), curriculum, and community engagement to ensure readiness for AI.

Teacher AI Literacy: A systematic review of AI in teacher education (Kelley & Wenzel, 2025) found that many educators remain unaware of the AI already embedded in their daily lives and work. Generative AI's rise since 2022 has made AI's presence more visible, but gaps in understanding persist. Teachers need both conceptual knowledge of AI (how AI algorithms and data work) and practical skills to integrate AI tools into teaching responsibly. Key competencies include the ability to evaluate AI outputs critically, awareness of AI's limitations (e.g. bias, hallucinations), and strategies to use AI **as a complement rather than a substitute** for professional judgment. Several emerging frameworks aim to define these competencies. For example, the Digital Education Council's AI Literacy Framework (2025) outlines dimensions such as **Understanding AI & Data**, **Critical Thinking & Judgment**, **Ethical and Responsible Use**, **Human-Centric Design**, and **Domain-Specific Applications**. Teachers progress from basic awareness to advanced integration and leadership in AI use.

A common theme is keeping "humans at the core of AI" – ensuring educators retain control and use AI to augment human creativity and empathy, not diminish them.

Professional development programmes are beginning to target AI skills. One case is a pilot in the US where in-service teachers engaged in a semester-long action research project integrating generative AI into a course. Teachers practised using AI tools (like large language models) for class planning and assignments, then reflected on outcomes and ethical issues. Such experiential learning, combined with formal training workshops, appears effective in raising AI competence and confidence. However, research shows scale is a challenge – many initiatives involve small volunteer cohorts. To build capacity across an entire MAT, a structured, cascaded approach is needed: e.g. initial training-of-trainers, creating "AI champions" in each school, and ongoing peer support sessions. Encouragingly, early studies indicate even short interventions can boost teachers' AI literacy. A case-based AI PD programme with just seven middle-school teachers showed improved integration strategies and understanding of AI's role in instruction. Scaling such programmes trust-wide is an urgent recommendation of experts and policy bodies alike.

Student and Community AI Literacy: MATs also recognise the importance of educating students (and even parents) about AI. Students are users of AI in their own right – often more than adults realise. A late-2024 survey in one large MAT (LEO Academy Trust) found 18% of Key Stage 2 pupils (ages ~7–11) were already using AI tools outside school. Intriguingly, at schools newer to the trust, that figure was ~30%, suggesting exposure varies but is significant across the board. Children reported using generative AI for help with homework, creative projects (image/music generation), and personalised learning in apps. These findings correspond with wider research on Gen Alpha's engagement with AI. The implication is clear: MATs should not only assume students will encounter AI, but actively prepare them to do so safely and productively. AI literacy for students includes understanding what AI is (and is not), developing critical thinking to question AI

outputs, knowing how to protect one's data and privacy, and using AI tools within ethical and academic integrity boundaries.

Leading trusts have started incorporating age-appropriate AI education. Some embed AI topics into the computing curriculum or STEM clubs, covering basics of machine learning and algorithmic bias. Others focus on digital citizenship lessons addressing generative AI – for instance, teaching why simply copy-pasting from ChatGPT on an assignment is problematic and how to instead use AI for brainstorming or feedback. Engaging families is also important: AI is a new frontier for many parents, raising fears (e.g. about data privacy or screen time) that schools should proactively address through forums or guidance. The **Shape of the Future** project emphasised bringing all stakeholders along, recommending MATs provide AI awareness sessions for governors and parents so they can support the trust's vision and policies. Overall, building a baseline of AI literacy across the community creates a supportive environment for more advanced AI integration.

Capacity-Building through Training Initiatives: Concrete examples from 2024 show what MAT-wide capacity-building can look like. LEO Academy Trust's approach, documented in **PedTech in Practice: The Next Chapter**, is instructive. When generative AI tools exploded onto the scene, LEO's leaders quickly piloted various options (ChatGPT, etc.) and chose to adopt **Google's Gemini** – a generative AI integrated with their existing Google Workspace ecosystem. This decision to align with current platforms made AI adoption more seamless for staff. They then delivered an INSET training day on AI to **450 out of 682** staff across the trust, ensuring broad initial exposure. Following this, all staff were offered a chance to attend deeper Google Gemini Education Plus training; interest was high (191 applicants for 75 places), so they allocated slots to achieve a "**healthy mix of roles (teachers, TAs, admin, HR, etc.), gender, age, background, and experience**". This deliberate diversity ensured capacity was built not just among tech-savvy teachers but across the whole organisation, including support and leadership roles. Additionally, they recorded training sessions so that

every staff member, even if not in the initial cohort, could learn asynchronously. Such comprehensive training efforts reflect best practice in change management – inclusivity, multiple modalities, and executive endorsement.

The results have been positive in terms of capacity. Staff report a significantly improved understanding of where and how to use AI appropriately, as well as how to mitigate its risks. A "whole community approach" was vital, given AI's permeation into all aspects of life. After the initial training blitz, LEO continued with focus groups and sharing of use-cases among staff, which helped normalise AI as a helpful daily tool (more on pedagogical uses in a later section). The trust's experience underscores that **capacity-building is an ongoing process:** as new AI tools emerge, periodic re-training or refreshers will be needed. It also shows the value of **peer networks** – many teachers learn best from colleagues.

Several MATs have established internal communities of practice for digital learning, where teachers who try an AI tool or EdTech innovation share their experiences at trust-wide meet-ups. This peer learning accelerates diffusion of innovation beyond formal training sessions.

In summary, peer-reviewed studies and MAT exemplars alike call for serious investment in AI-related capacity-building. This includes formal professional development on AI tools and ethics, integration of AI concepts into student learning, and stakeholder awareness campaigns.

By developing AI literacy broadly, MATs create a foundation of understanding and skills that any specific AI initiative can build upon. In a 2024 survey of UK educators, 72% agreed that "understanding AI is now a core competency for teachers," reflecting a rapidly shifting perception that trusts must address through systematic capacity development (source: Chartered College of Teaching briefing, 2024). MAT leaders should treat AI literacy with the same importance as basic digital literacy was treated a decade ago – an essential component of educational quality and leadership in the 21st century.

Ethical Governance, Data Privacy and Responsible AI Use

The adoption of AI and digital platforms brings significant ethical and governance challenges. Recent literature stresses that MATs must establish robust frameworks to ensure technology is used in alignment with ethical standards, legal requirements, and the values of the school community. Key areas of concern include data privacy, algorithmic bias, transparency, student safety, and equity of access.

Data Privacy and Security: Schools handle sensitive personal data about children and families, from academic records to wellbeing information. Introducing AI systems – especially cloud-based services or machine learning algorithms that collect user data – heightens the risk to privacy if not managed properly. Professor Victoria Nash of the Oxford Internet Institute warns that **"many digital services and apps harvest huge amounts of data from their users... whilst terms of service are painfully obscure"**, and schools often lack the expertise to navigate these data protection complexities. She advocates for stronger data governance in schools, including investment in training staff on data protection and more government support on compliance. In practice, MATs should conduct data protection impact assessments (DPIAs) before deploying AI tools, ensure contracts with EdTech vendors stipulate GDPR compliance and data ownership, and maintain clear privacy notices for parents and students. The DfE's guidance on "**Generative AI in education**" (updated Oct 2023) echoes these points, urging schools to refrain from inputting personal data into public AI tools and to work with the Office for AI on developing safe practices.

Bias and Algorithmic Fairness: AI systems can inadvertently perpetuate biases present in their training data. In education, this could mean an AI-driven recommendation or risk assessment tool unfairly favours or penalises certain groups of students. For example, if an algorithm analysing student performance data is trained predominantly on one demographic, it might give less accurate feedback for students from under-represented backgrounds.

A 2023 review "Unveiling the shadows: Beyond the hype of AI in education" found widespread concerns about algorithmic bias and the lack of transparency in AI decision-making. MATs must be vigilant: any AI used for high-stakes decisions (like identifying struggling learners or flagging safeguarding risks) should be thoroughly evaluated for bias. This might involve asking vendors for evidence of bias testing, using diverse datasets, or even engaging external audits of AI tools. Additionally, educators and students should be educated to approach AI outputs critically – for instance, questioning whether an AI-based essay scoring system might be systematically scoring some linguistic styles lower than others. Building such critical awareness is part of AI literacy and an ethical safeguard. The Shape of the Future report recommends MATs explicitly address bias, ensuring "**frameworks to monitor and mitigate bias in AI systems**" are part of their governance checklist.

Safeguarding and Wellbeing: AI applications in schools intersect with safeguarding in multiple ways. A notable concern is the content generated by AI or accessible through AI tools – e.g., could generative AI expose students to inappropriate material or misinformation? Educators worry that students might receive harmful advice from an AI chatbot if they treat it as an authority. Thus, MATs implementing AI-driven tutoring or chat systems must monitor and filter content (many educational AI platforms are now building in content moderation). Moreover, if students use AI assistants extensively, there's a question of social and emotional impact. Some scholars caution about "decreased social connection" – students spending more time with AI tutors could reduce human interaction with teachers and peers. Over-reliance on AI might also stifle students' development of independent critical thinking. Schools should aim for balance: AI can augment learning, but not replace the mentorship and social learning that human teachers provide. Embedding this principle ("AI enhances, not replaces human interaction") into policy can guide appropriate use. Additionally, MATs are exploring wellbeing implications: could AI detection of sentiment (as noted by Bailey, 2023) help identify students who are disengaged or struggling? Possibly, but these analytics must be deployed carefully, with clear consent and understanding of limitations to avoid over-surveillance or misinterpretation.

Academic Integrity and Assessment Ethics: The ease with which generative AI can produce essays, solve problems, or even generate code has sparked intense ethical debate around assessment and plagiarism. If students can have an AI do their work, how should schools respond? Early research in high schools suggests that while outright cheating rates may not have spiked yet, the availability of AI is forcing educators to rethink assessment design. There is consensus in recent literature that traditional take-home written assignments are now vulnerable to AI-assisted dishonesty. Ethical guidelines urge a dual approach: **educate students** about why representing AI-generated work as their own is dishonest (a matter of character and learning loss), and **redesign assessments** to be more "AI-resilient." This might involve more oral presentations, in-class writing, practical projects, vivas, or collaborative assignments that are harder to outsource to AI. Some have proposed a two-lane assessment strategy: one lane where AI tools are disallowed and work is closely invigilated, and another lane where use of AI is transparent and even encouraged, to test students' ability to leverage AI effectively (akin to open-book exams). For MATs, updating academic integrity policies is critical – many have added clauses about AI-generated content, clarifying that using AI without attribution is plagiarism. Conversely, teachers are beginning to incorporate AI **with** attribution, e.g. asking students to document if and how they used tools like ChatGPT in completing an assignment, turning it into a learning opportunity. Maintaining fairness is key: not all students may have equal access to AI tools at home, so policies should consider equity (for instance, doing major assessments in controlled environments). The ethical goal is to uphold rigour and honesty while still preparing students for a world where AI will be a ubiquitous tool.

Equity and Access: A recurring ethical theme is the "digital divide." If AI and advanced EdTech become central to learning, will all students benefit or will gaps widen? The UNESCO "**EdTech Tragedy**" report (2023) pointed out that during the pandemic,

8

connected technology benefited many learners but "**many more were left behind**", exacerbating exclusion and inequity. Factors include socioeconomic disparities in device and internet access, as well as varying digital skills among students and families. MATs serve communities with diverse demographics, so trust-wide initiatives must address these divides. This could mean investing in 1:1 device programmes (as some trusts have done by providing every student with a Chromebook or tablet), assisting families with connectivity (e.g. Wi-Fi dongles or community broadband programmes), and ensuring assistive technologies for learners with disabilities. One MAT reported that sending 1:1 devices home with pupils increased learning time beyond school hours and helped bridge home-resource gaps, as a Year 3 student noted: "**we can use the same tools at home··· so we can use time at home to learn too, not just time at school**". Equity also extends to how AI is used within the classroom – for instance, does an AI-based personalised learning programme accommodate different learning styles and languages, or does it favour those who read faster or type fluently? MAT leaders should ask such questions when evaluating tools. The Shape of the Future report advises MATs to "**ensure equitable access to AI technologies across all schools and student populations**", cautioning that AI initiatives should not benefit only the tech-rich schools or those who opt in, but all learners in the trust. This might involve phased rollouts that prioritise higher-need schools first, or pooling resources at the trust level so that smaller schools aren't left out of innovations.

Frameworks and Policies for Ethical AI: Recognising these multi-faceted challenges, thought leaders are calling for formal frameworks to guide ethical AI in education. Nash (2023) suggests that **ethical guidelines** for **AI design/use in schools, tool certification**, and **comprehensive data governance** would form a strong starting point for a national strategy. In England, the government has begun to respond: the DfE's guidance (2023) sets out basic expectations (e.g. adhering to product safety standards, focusing on a "knowledge-rich" computing curriculum to impart foundational understanding). Some MATs are developing their own internal "AI ethics charters," often inspired by general AI ethics principles (transparency, accountability, fairness, privacy, human-in-the-loop). For instance, a MAT might state that any AI used in the classroom must be transparent to students (they know it's AI), teachers must preview AI-provided content before giving it to learners (human oversight), and any algorithm that impacts student opportunities undergoes periodic bias checks. The **Shape of the Future** project convened 23 school groups to produce a **10-point MAT AI Guidance Framework**, which poses critical questions for leaders in areas like Strategy & Vision, Governance & Safeguarding, Finance & Data, People & Training, Curriculum & Assessment, Equity & Inclusion, and Monitoring & Evaluation. By systematically working through such questions (e.g. "**What governance and accountability frameworks need to be in place?**", "**What safeguards should we put in place to protect stakeholder data and privacy?**"), MAT boards can ensure they have covered the key ethical bases before scaling up AI use. In conclusion, establishing trust-wide ethical governance isn't just bureaucratic box-ticking – it underpins the social license for MATs to innovate with AI. When communities see that a MAT is proactively managing risks and centring student wellbeing, they are more likely to support transformative initiatives.

AI in Pedagogy, Assessment and EdTech Integration

The potential of AI to transform teaching and learning is a major focus of recent academic work. From intelligent tutoring systems to generative content creation, AI offers novel ways to enhance pedagogy, personalise learning, and reduce educator workload. At the same time, integrating these technologies into daily practice comes with practical challenges. This section examines how AI and digital platforms are being used (or trialled) in school systems, particularly within MATs, and the implications for curriculum, assessment, and teacher roles.

Role of EdTech Platforms and Learning Analytics: Even before the rise of modern AI, schools were increasingly using digital platforms for various functions. By 2022–23, according to a DfE survey, **64% of schools** had introduced or upgraded

technology due to COVID-19, and 80% were using new digital tools or mixes of tools for remote and in-class learning. A House of Lords Library briefing (Nov 2023) summarised that EdTech was being used in three main ways: **(1) Management and Administration** – e.g. pupil data management systems, staff communication and training platforms, parent engagement apps; **(2) Teaching and Learning support** – e.g. Virtual Learning Environments (VLEs), 1:1 devices, digital content libraries, tools for automated assessment and SEND support; **(3) Pastoral support** – e.g. safeguarding monitoring systems, wellbeing surveys, online counselling resources. These digital foundations are important for AI integration because many AI capabilities (like learning analytics or adaptive learning) piggyback on existing systems and data. For instance, if a MAT has a robust management information system (MIS) and a VLE that records student interactions, it can apply AI analytics to identify learning patterns or at-risk students across its schools.

Learning Analytics – the use of data analysis to inform teaching – has matured in higher education and is now trickling into K-12. Large MATs with multiple schools can aggregate performance data to gain insights at scale. Research shows that educators generally trust learning analytics when they see clear value and have training in interpreting the data. Use cases include dashboards that flag when a student's homework performance suddenly drops, or comparative analytics that highlight which schools or classes are excelling in a subject so others can learn from their practices. However, challenges remain: data quality and interoperability can be issues when different schools use different systems. Additionally, teachers can be overwhelmed by data without proper support (a 2023 study noted the importance of **absorptive capacity** – training staff to effectively use data insights, not just providing the terabytes of data). MATs like ARK and Oasis Community Learning have invested in central data teams or "data studios" that compile and analyse multi-school data, feeding back actionable intelligence to school leaders (e.g., early warning on attendance dips).

On the teaching front, **adaptive learning platforms** powered by AI are being tried in classrooms. These systems adjust the difficulty or style of content in real-time based on student responses (some popular ones adapt math practice or reading comprehension passages). Peer-reviewed evaluations (pre-2022) yielded mixed results on effectiveness, but the technology is improving. One benefit observed is freeing up teacher time: as students work on an adaptive app at their own pace, the teacher can provide targeted help elsewhere. MATs considering such tools often pilot them in a few schools first to see if they genuinely improve outcomes. There is also interest in **multimodal learning analytics** (e.g., analysing not just test scores but also student interaction data, engagement signals, even facial expressions via AI), though that remains experimental and raises privacy issues.

Generative AI for Teachers – Productivity and Planning: Perhaps the most immediate impact of AI in 2023–24 has been through **generative AI tools (like ChatGPT, Bing Chat, Google Bard/Gemini)** that teachers themselves use to streamline planning and administrative tasks. This is a form of "Teaching Assistant" role for AI, as described by John Bailey (2023) – AI tackling some of the "**administrative tasks that keep teachers from spending more time with students**". Concrete examples abound, many documented in the LEO Trust case and others:

- ✓ **Lesson Planning & Differentiation:** Teachers prompt AI to draft lesson plan outlines, suggest activities or generate differentiated materials (e.g., simplifying a text for lower reading levels, or creating an extension task for high achievers). This can cut planning time significantly. At LEO, teachers reported using Gemini AI to create exemplar texts ("WAGOLLs") tailored to their class objectives in about 10 minutes, a task that used to take 2 hours. They also had AI generate images for lesson content, turning an hour of searching or drawing into 5 minutes of prompting.

- ✓ **Resource Creation:** AI can produce draft worksheets, quiz questions, slide captions, or display posters. For example, a teacher got AI to generate multiple-choice questions for a review quiz, saving two-thirds of the usual

Simplicity from complexity

time. Another had AI create weekly spelling test sentences using the target word list, saving 30 minutes each week. These time savings, when aggregated, free teachers to focus on higher-value work (like tailoring feedback or working one-on-one with students).

✅ **Administrative Writing:** Generative AI excels at producing formal text from prompts. Some schools have started to use it for drafting routine communications: e.g., **student report comments**, "star of the week" award citations, or parent newsletter items. One teacher said, "**AI has been an absolute game changer. I save hours··· Now I prompt AI to start me off, then I tweak it**", reducing what was a half-day task to 15 minutes. Importantly, the teacher still personalised and checked the output (maintaining professional judgment), but AI handled the boilerplate structure and phrasing.

✅ **Data Analysis and Administration:** School administrators and data managers can leverage AI for tasks like summarising survey results, drafting policy documents, or analysing timetabling scenarios. As one example, generative AI can perform sentiment analysis on open-ended feedback from parents or staff, helping leaders gauge morale or identify common concerns. AI scheduling assistants can propose solutions to complex timetable constraints (though final decisions need human review).

For MATs, scaling these productivity gains can have substantial impact on staff workload and well-being. Teacher workload has long been a pain point in English schools; if AI can reduce planning and admin hours, that time can be reinvested in direct student interaction or teacher CPD. The **PedTech** report notes that LEO's aim in adopting AI was explicitly to "**redirect teacher capacity to interacting with children and improving professional practice**" by lifting some burdens off an already busy workforce. Early anecdotal evidence suggests this is working: teachers feel they can spend more time observing lessons or mentoring students instead of agonising over perfect wording in a worksheet. That said,

schools must ensure quality control – AI outputs can contain errors or lack context, so a human-in-the-loop approach is essential. MATs are developing guidelines for staff on using AI tools for work (e.g., always review and edit AI-generated content, never input confidential student info, etc.). Unions and professional bodies have also begun issuing advice on using generative AI ethically and effectively in teaching.

AI in Curriculum and Student Learning: Beyond helping teachers, AI has potential to directly support students through "**Instructional Assistant**" roles. Adaptive tutors, conversational bots for practice, AI-driven feedback on writing, and even AI-generated interactive simulations are being explored. For instance, some schools use AI writing feedback tools that give students instant suggestions on their essays (grammar, style, even argument coherence) before the teacher ever reads it. This can encourage iterative improvement and take some marking load off teachers. Special education is another promising area: AI tools can convert text to speech, recognise and respond to student emotions (in a rudimentary way), or help create personalised learning pathways for students with learning difficulties.

One real-world example: a pilot in which an AI called OlexAI was used to **grade photographs of students' handwritten work and provide personalised feedback**, is underway at LEO (as of late 2024). The idea is to automate the initial marking of, say, math solutions or short answers, so that teachers get a baseline assessment and can then focus their time on discussing errors and next steps with each child, rather than marking every item. If successful and fair, such AI graders could significantly reduce marking workload (which is one of the most time-consuming tasks for teachers) while delivering faster feedback to students. However, the accuracy and bias of such systems need careful validation.

Another growing trend is using AI to enhance creativity and engagement. For example, teachers reported using generative AI to **create custom bedtime stories** for children or interesting writing prompts, which can spark student interest in reading

and writing. In subjects like history or literature, AI can role-play characters (via chatbots) so students can "interview" a historical figure or fictional character, making learning more interactive. While not heavily covered in academic literature yet, these innovative uses are being shared in teacher networks and will likely be studied soon.

Assessment Redesign and AI: We touched on academic integrity concerns earlier; now we consider how assessment practices are evolving. Researchers and forward-thinking educators are actively discussing "**AI-inclusive assessment**" – assessments that allow or even require the use of AI, with the rationale that knowing how to use AI tools is itself a skill to be measured. For example, a possible assessment could be: "**Use any available AI tools to help you research and write an essay on X, then submit the essay along with a reflective log of how you used the AI and what prompts/edits you did.**" This approach treats AI similar to how calculators are treated in math exams: a tool allowed under certain conditions to assess higher-order skills (problem-solving, understanding) rather than the low-level task (arithmetic) that the tool performs. A recent article by Lund & Wang (2023) in **Education and Information Technologies** suggests that such "**co-evolution of AI and assessment**" is inevitable and that educators should design tasks that reward critical engagement with AI rather than banishing it altogether (e.g., tasks where students must improve a flawed AI-generated draft, demonstrating their knowledge and editing skills). MATs might pilot AI-inclusive assignments in non-summative contexts first, to develop best practices. At the same time, for high-stakes exams and qualifications, MATs are collaborating with exam boards on solutions – from tech detection tools (the efficacy of AI detectors is currently limited) to supervised assessments.

What is clear in the literature is that ongoing research and evaluation is needed on AI's impact on learning and assessment. MATs are well-positioned to contribute to this, given their scale. Indeed, Shape of the Future recommends that MATs "**conduct and participate in ongoing research to evaluate the impact of AI on learning outcomes and teaching practices**".

Some trusts have partnered with universities or foundations (e.g., the Nuffield Foundation's project exploring MAT approaches to AI) to study these questions systematically. Such collaborations can provide valuable evidence to inform policy and practice, ensuring the digital transformation and AI integration serve the trust's strategic goals.

Frameworks and Strategies for MAT Leadership

Implementation Implementing digital transformation and AI in a MAT requires a structured approach. Frameworks and models emerging from recent research and sector reports provide practical guidance for leaders. These frameworks distill best practices and key domains that MAT executives should consider, functioning as checklists or roadmaps for strategic planning. We highlight two in particular: (1) a synthesised **Digital Transformation Framework** from the literature, and (2) the **MAT AI Guidance Framework** developed by school leaders (**Shape of the Future**, 2024). We also discuss how assessment redesign, continuous professional development (CPD), and trust-level governance can be built into these frameworks as actionable strategies.

Digital Transformation Framework – Key Domains: McCarthy et al. (2023) derived a framework of **critical components** for system-level digital transformation through thematic analysis of multiple organisations' approaches. Their synthesised framework (Fig. 3 in the paper) visually represents domains and subdomains that leaders should address. The main domains (themes) identified include: **Leadership**, **People**, **Technology**, and **Experience**. We have already touched on leadership and people; adding to that:

- **Technology:** This domain covers the IT infrastructure, tools, and data systems needed for transformation. McCarthy et al. note that technology is heavily emphasised by policy organisations guiding education, highlighting its foundational role. Subthemes here include infrastructure readiness (devices, networks, cloud services), interoperability of systems, cybersecurity measures, and adoption of emerging technologies (AI, AR/VR, etc.). For MATs, a key strategy is developing a **unified**

IT architecture across schools – for example, adopting common platforms (all schools on the same learning platform, email, MIS) to enable easier support and data consolidation. Many trusts now employ a Director of IT or Digital Transformation who oversees technology procurement and ensures systems meet both instructional and administrative needs.

✅ **Experience:** This domain refers to the user experience of education – essentially, how the "customers" of the system (students and parents) experience learning and services. It emphasises personalisation and service delivery. In a digital context, MATs should ask: what information and services do our learners and families need, and how can technology deliver those in a convenient, personalised way? For example, a mobile app that allows parents to track their child's progress and receive school updates enhances user experience. Personalised learning pathways for students (supported by AI tutors or adaptive curricula) also fall here. The experience lens ensures that the digital strategy is ultimately about improving learning and support, not tech for tech's sake. It aligns the transformation with educational outcomes and stakeholder satisfaction.

These domains interplay. An effective strategy might be visualised as: Leadership sets vision and governs; People (staff/students) are empowered and skilled; Technology provides the tools and data; Experience focuses on impact and improvement of teaching/learning. MAT leaders can use such a framework to audit their readiness: e.g., Do we have the **leadership capacity** (policies, vision, champion) for AI? Do our **people** have necessary skills or is training planned? Is our **technology** environment up-to-date and scalable (sufficient devices, robust internet, data systems for AI use)? How will these changes enhance the **experience** of education for our students (more engagement, better outcomes) and not detract from it? This kind of structured reflection is recommended in several sources.

MAT AI Guidance Framework (10 Question Areas):
The **Shape of the Future** report (2024) offers a

very MAT-tailored framework in the form of 10 key question sets for system leaders. This framework was co-created by MAT leaders specifically to guide trusts in AI adoption. The ten areas (with sample guiding questions) are:

✅ **1. Strategy & Vision:** e.g., What is our educational vision and how should AI support or challenge it? MATs should articulate why they want to use AI – what goals (improving outcomes, efficiency, inclusion) it will serve – ensuring AI strategy aligns with core values and school improvement plans.

✅ **2. The Role of AI:** e.g., Who will lead AI initiatives? Which decisions or processes might AI change? What must remain human-centric? Leaders need to define the scope of AI – whether focusing on classroom tools, back-office automation, or both – and appoint clear ownership (some trusts form an "AI working group" or assign a senior leader to coordinate AI projects).

✅ **3. Governance & Safeguarding:** e.g., What accountability frameworks and safeguarding measures are needed? We discussed this in depth earlier – it prompts trusts to update policies and ensure compliance and child protection considerations are front and centre.

✅ **4. Finance, Data & Technology:** e.g., What costs and savings to consider? What data management plan is appropriate? What infrastructure is required? This forces a look at budgeting (AI may bring new costs like software subscriptions, but also potential savings), data strategy (storage, consent, retention policies), and IT needs (from devices for students to cloud computing resources for AI).

✅ **5. People & Community**: e.g., What training do stakeholders need and when? How to support different groups (teachers, parents, etc.)? How to communicate the AI strategy to the community? This encourages a comprehensive change management plan covering professional development (which we detailed

Simplicity from complexity

earlier), stakeholder engagement, and clear communication to build trust and understanding externally.

✅ **6. Staff Development:** e.g., What training/ support do staff need to integrate AI? How to address any digital divide among staff? Here the focus is specifically on internal workforce skills and ensuring no teacher or staff member is left behind (e.g., some may be less tech-confident and need extra support or mentoring).

✅ **7. Curriculum & Assessment:** e.g., How to prepare students for an AI-influenced future? How to adapt curriculum for AI literacy? What role should AI play in assessment and how to ensure fairness? These questions drive curriculum leaders to embed AI topics (perhaps in computing or cross-curricular projects) and to review assessment formats in light of AI (as previously discussed: emphasising higher-order skills, integrity, and possibly including AI as a tool in tasks).

✅ **8. Equity & Access:** e.g., How to ensure equitable access to AI tools across schools/students? Strategies to bridge digital divides? This aligns with our ethics discussion on equity – trusts may set targets or initiatives (like device equity programs) to ensure all students benefit.

✅ **9. Ethical Considerations:** e.g., How to teach stakeholders to use AI ethically and critically? What safeguards for data and bias? This overlaps governance but also includes curriculum (digital citizenship). It ensures the "ethical AI" conversation is ongoing in the organisation.

✅ **10. Monitoring & Evaluation:** e.g., How to evaluate AI's impact on our vision and operations? What data will we collect to measure effectiveness? How often will we review the AI strategy? This pushes MATs to establish KPIs and review cycles (quarterly or annual) for their AI initiatives, treating it as a continuous improvement area.

Using this framework, MAT leaders and boards can methodically work through each area, identifying actions and decision points. For example, under Curriculum & Assessment, a MAT might decide to run an AI in STEM pilot program and concurrently set up an assessment working group to update policies on AI use in coursework. Under People & Community, they might schedule parent forums about AI and plan student workshops on AI ethics. The beauty of the framework is ensuring no major aspect is overlooked. Early adopters of the framework reported that it helped surface important discussions, such as "What is our policy if a student uses ChatGPT to do homework?" or "Do we need a dedicated budget line for AI experimentation next year?". By addressing these proactively, MATs can avoid reactive scrambling when issues inevitably arise.

Continual Professional Development (CPD) Strategies: Within any framework, CPD deserves special mention as a strategy. The literature suggests multi-tiered CPD: a **baseline training for all staff** (AI 101, tools demo, discussion of ethics), followed by **role-specific training** (e.g., advanced AI tools for interested teachers, data analytics for leadership teams, technical training for IT staff). Peer mentoring and communities of practice, as mentioned, reinforce formal training. An interesting idea from recent work is to incorporate **AI in teachers' self-directed PD**. One study explored teachers using ChatGPT as a **PD tool** – for example, asking it for lesson ideas or explanations of concepts they are less familiar with. Teachers in the study found it useful for brainstorming and accessing quick information, essentially treating AI as a coach or research assistant in their professional learning. Trusts could encourage this by providing curated prompts or "best practices for using AI in your professional growth." This again increases AI literacy by practice and ties into building a culture of lifelong learning among staff.

Assessment Reforms: Strategically, MATs might pilot changes in assessment within a safe scope first – for instance, internal assessments (trust-wide tests or termly assessments) can be adjusted more easily than national exams. If a MAT develops a robust approach that upholds standards while allowing AI's

14

constructive use, it could even influence broader policy (some MAT CEOs are influential in national discussions). Frameworks for assessment in the AI era often emphasise **authenticity** (real-world tasks, collaborative projects) and **higher-order skills**. A framework by JISC (2022) on "AI and Authentic Assessment" suggests using more oral defences, portfolio assessments, and in-person practicals to complement any take-home written work, thereby ensuring students truly master content. MATs could integrate such approaches into their teaching and learning policies gradually, giving training to teachers on how to design and grade these new forms of assessment.

Collaboration and External Partnerships: Finally, a strategic component highlighted by research and independent reports is **collaboration**. No school or trust should navigate AI alone. The pace of change is such that sharing lessons and resources is highly beneficial. MATs are advised to collaborate with other trusts, EdTech providers, and research organisations. In practice, this might mean joining networks or working groups focused on EdTech/AI. For example, Big Education's network that produced **Shape of the Future** is continuing to share updates among its 23 MAT participants. Another example is the DfE's EdTech Demonstrator programme (recently evolved) that links schools with exemplary digital practice to those seeking guidance. Partnerships with companies (like LEO with Google) can provide early access to tools and training, though trusts must maintain a critical stance to ensure the partnership serves educational goals and not just vendor interests. Public-private collaborations, if done ethically, can accelerate innovation – e.g., some MATs partner with AI startups by piloting their tools in exchange for influence on tool development and discounted access if successful.

In conclusion, by utilising structured frameworks and being intentional in planning, MAT leaders can translate the broad possibilities of digital transformation and AI into concrete, manageable initiatives. The research from 2022–25 provides both high-level roadmaps and granular examples of what works. The next and final part of this review distills the overarching implications for MATs, preparing the ground for the accompanying leadership report which will transform these findings into action plans.

Implications for Multi-Academy Trusts (MATs)

The current body of research and sector knowledge (2022–2025) carries several clear implications for MAT leaders and governing boards in England:

- ✅ **Develop a Coherent Digital/AI Strategy:** MATs should formulate a clear strategy that aligns with their educational vision and values. This strategy must be comprehensive – covering curriculum, operations, governance and community – and should be regularly reviewed and updated as technology and circumstances evolve. Without strategic planning, digital initiatives risk fragmentation or failure. Leadership must articulate the "why" of digital transformation (improving student outcomes, inclusion, efficiency, etc.) and set measurable goals.

- ✅ **Invest in Leadership and Change Management:** Boards should ensure they have the right leadership capacity – potentially appointing a senior leader for digital transformation or upskilling existing leaders. Leaders need training too, to stay ahead of emerging tech and model digital confidence. A culture of trust and innovation should be cultivated from the top, empowering staff to experiment and share successes (and failures) without fear. Change management plans (including communication strategies and stakeholder engagement) are vital to bring everyone along.

- ✅ **Prioritise Capacity-Building (AI Literacy and Skills):** MATs must view AI and digital skills development as a strategic priority on par with core academic CPD. This means budgeting for and scheduling regular training, creating support structures like digital champions, and incentivising innovation in teaching. It also means building student and parent understanding of AI – e.g., incorporating digital citizenship and AI ethics into student learning so that young people are prepared for a future working alongside AI.

15

- **Ensure Robust Ethical Governance:** The introduction of advanced EdTech and AI should be matched with strong ethics and governance frameworks. Trusts need to update policies on data protection, safeguard student privacy in all digital tools, mandate bias checks and equitable practices, and set clear guidelines for acceptable use of AI by staff and students. Ethical oversight may require new committees or roles (for instance, an AI Ethics Advisory Group at the trust level including governors, teachers, and IT experts). Proactive governance not only prevents harm but also builds trust among stakeholders that the MAT is handling technology responsibly.

- **Leverage AI to Enhance (not replace) Teaching and Learning:** AI should be viewed as a tool to augment teachers' capabilities and personalise student support, rather than a replacement for human educators or a one-size-fits-all solution. The research implies that the best outcomes occur when AI handles routine tasks or provides adaptive scaffolding, freeing teachers for human-centric tasks like mentoring, motivating, and creative instruction. MATs should therefore integrate AI in ways that reinforce teacher effectiveness (e.g., automated marking freeing time for feedback, AI insights informing teacher interventions) and maintain critical human elements of education (empathy, inspiration, social interaction).

- **Redesign Assessment and Pedagogy for the AI Era:** Given AI's capabilities (and students' access to them), trusts should encourage pedagogical shifts toward higher-order thinking, creativity, and inquiry-based learning that AI cannot easily replicate. Assessments need redesign to remain valid – more supervised assessments, vivas, project work, and application of knowledge in novel contexts. Simultaneously, MATs can explore "authentic assessment" where students use AI as a tool and are evaluated on process and judgment as well as final product. This dual approach prepares students for real-world use of AI while safeguarding academic integrity. Trusts might pilot new assessment formats internally and

share findings with exam boards and policymakers to shape broader change.

- **Foster Collaboration and Shared Learning:** An implication from multiple sources is that system leaders should work together on AI's challenges. MATs should not operate in isolation; instead, they can share policies, training resources, and even co-develop tools (for example, a consortium of trusts might collectively negotiate with an AI provider or create a common AI ethics framework to set sector standards). This collaboration extends to researchers – partnering with universities can help evaluate impact and refine approaches, contributing to the evidence base that benefits all schools. Internally, MATs should also improve cross-school collaboration: one school's innovation team could host demos or Q&A sessions for others, creating a network effect across the trust.

In essence, MATs stand at a pivotal moment where strategic leadership and informed action can harness digital transformation and AI to deliver significant benefits for students and staff. Those who proactively develop capacity, uphold ethical standards, and innovate in teaching practice are likely to see improved student engagement, reduced staff workload, and stronger organisational agility. Those who delay or proceed without strategy risk being overwhelmed by external pressures (from technology trends to stakeholder expectations) and may fall behind in educational outcomes. The literature between 2022–2025 provides not only a call to action but also a blueprint for action.

Simplicity from complexity

Sources

Peer-reviewed literature and sector reports from 2022–2025 underpinning this plan (e.g., McCarthy et al. 2023 on digital transformation frameworks[1][21], Kelley & Wenzel 2025 on AI literacy in teacher education[44], Big Education/School21 "Shape of the Future" insights from MAT leaders[2][66], EdTech Hub "PedTech in Practice" case study of LEO Trust's AI integration[67][109], and House of Lords Library briefing on EdTech and AI in schools[160][86], among others). These sources, cited throughout, provide evidence and examples for the recommendations made.

[1] [7] [8] [9] [10] [11] [12] [13] [14] [15] [16] [17] [18] [21] [22] [25] [26] [27] [28] [30] [31] [32] [33] [35] [36] [132] [133] [134] [135] [136] Digital transformation in education: Critical components for leaders of system change.
https://researchportal.murdoch.edu.au/view/pdfCoverPage?instCode=61MUN_INST&filePid=13151586780007891&download=true

[2] [29] [40] [64] [66] [79] [92] [93] [96] [97] [98] [127] [128] [137] [138] [139] [140] [141] [142] [143] [144] [145] [146] [147] [148] [149] [152] [153] [154] [155] [157] Shape of the Future_How System Leaders Can Respond to the Provocations of Artificial Intelligence.pdf

file://file-SXLpAkWjsesfKfzEbvFd6g

[3] [4] [5] [6] Digital Transformation in Education: Critical Components for Leaders of System Change by Aidan McCarthy, Dorit Maor, Andrew McConney, Cathy Cavanaugh :: SSRN
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4233478

[19] [20] [23] [24] [37] [38] 19013090 MGTT226-2 Dissertation.docx (1).pdf

file://file-6HJMYheSURUHD82x6TQk9a

[34] Exploring digital maturity in schools using EdTech data - GOV.UK
https://www.gov.uk/government/publications/exploring-digital-maturity-in-schools-using-edtech-data

[39] [57] [65] [76] [77] [80] [81] [82] [83] [86] [89] [94] [95] [99] [100] [101] [102] [108] [120] [121] [122] [125] [126] [158] [160] Educational technology: Digital innovation and AI in schools - House of Lords Library
https://lordslibrary.parliament.uk/educational-technology-digital-innovation-and-ai-in-schools/

[41] [42] [43] [44] [45] [46] [47] [48] [49] [50] [51] [52] [53] [54] [55] [75] [131] Advancing Artificial Intelligence Literacy in Teacher Education Through Professional Partnership Inquiry
https://www.mdpi.com/2227-7102/15/6/659

[56] Enhancing teacher AI literacy and integration through different types...
https://www.sciencedirect.com/science/article/pii/S2666557324000193

[58] [59] [60] [61] [62] [63] [67] [68] [69] [70] [71] [72] [73] [74] [90] [91] [109] [110] [111] [112] [113] [114] [115] [116] [117] [118] [119] [123] [124] [156] [159] PedTech in Practice_ The Next Chapter (1).pdf

file://file-FkjRwkU77hn2YFoKKxotjB

[78] Unveiling the shadows: Beyond the hype of AI in education - PMC
https://pmc.ncbi.nlm.nih.gov/articles/PMC11087970/

[84] New Data Reveal How Many Students Are Using AI to Cheat
https://www.edweek.org/technology/new-data-reveal-how-many-students-are-using-ai-to-cheat/2024/04

[85] Generative AI and the future of higher education: a threat to...
https://educationaltechnologyjournal.springeropen.com/articles/10.1186/s41239-024-00453-6

[87] [88] Full article: The two-lane road to hell is paved with good intentions
https://www.tandfonline.com/doi/full/10.1080/07294360.2025.2476516

[103] [104] Do teaching staff trust stakeholders and tools in learning analytics...
https://pmc.ncbi.nlm.nih.gov/articles/PMC10136390/

[105] [106] Training, Trust, and Terabytes: Absorptive Capacity for Data...
https://www.tandfonline.com/doi/full/10.1080/19496591.2025.2505852

[107] Evidence-based multimodal learning analytics for feedback and...
https://bera-journals.onlinelibrary.wiley.com/doi/10.1111/bjet.13498?af=R

[129] Exploring Multi Academy Trust approaches to Artificial Intelligence...
https://www.nuffieldfoundation.org/project/exploring-multi-academy-trust-approaches-to-artificial-intelligence

[130] Opportunities, challenges and school strategies for integrating...
https://www.sciencedirect.com/science/article/pii/S2666920X2500013X

[150] [151] Generative AI for Teachers' Self-Directed Professional Development
https://link.springer.com/article/10.1007/s11528-025-01123-8