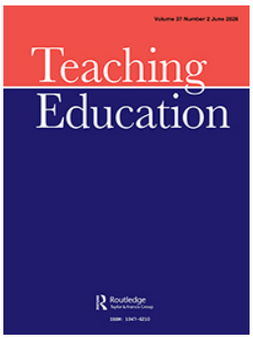

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The ex-machination of teacher education: a genealogical critique of the politics of AI and the 'responsibilities' of teacher educators

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ABSTRACT

Adopting a critical genealogical method inspired by Foucault, complemented by Shoshana Zuboff's theorisation of surveillance capitalism, this article analyses the position of AI in education as a technology of governance within the forces of algorithmic futuring. In teaching, attention has turned to the challenges faced by the profession regarding the ethical use of AI in the classroom. However, much of this discourse neglects the inherent governing politics of these technologies as well as their inherent violence in reproducing systemic injustices. In part, this is symptomatic of a failure to observe the accurate historical positioning of AI as the result of convergences of several core vectors, characterised by their rise in the neoliberal era. Our analysis considers a range of official and media discourses underpinning the emergence of AI, and associated politics, within the current policy landscape related to teaching and teacher education. Our findings challenge AI's ostensible novelty amid genealogies of corporate influence, rendered intelligible amid forces of datafication in education, and culminating in recent intergovernmental organisation discourses centred on transforming teaching and teacher education. We excavate a colonial 'politics of ex-machination' seeking to evolve an outmoded teaching profession and transforming teachers into techno-pedagogues and ethical gatekeepers.

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AI in education; teachers; governance; critical EdTech; educational policy

Introduction

The emergence of generative artificial intelligence[1] (AI) technologies in late 2022 marked the onset of a significant unsettlement across education and teaching. While these technologies have been an ongoing element of contemporary life, the emergence of openly accessible generative AI, with its seeming intelligence capable of producing human-like texts, has significantly influenced present discourses surrounding teaching and learning (Selwyn, 2024). The significant increase in interest regarding AI in education (AIED) has manifested across several techno-optimistic themes such as 'personalised

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learning', increased administrative efficiencies, and enhancing inclusion and equity (e.g. Anderson et al., 2025; Pesovski et al., 2024; Yu & Guo, 2023). Understandably, teachers across all sectors are anxious as to what the effects on their everyday contexts will be and how AIED will change their practice and professional identities. Subsequently, intergovernmental organisations have developed guidelines and competency frameworks for conceptualising the integration of AI within pedagogical and broader professional practices (e.g. OECD, 2025a; UNESCO, 2024). These discourses continue to extol the onset of AIED as a transformative good. However, resisting this techno-optimistic framing, critical research in educational technology has simultaneously emerged demonstrating *inter alia* the technical treatment of ethics (Mochizuki et al., 2025), the role of AI in algorithmic governance (Williamson et al., 2024) and the capacity for imposing a new form of education contrary to a public democratic ethos (Sriprakash et al., 2024).

This article is concerned with the discourses shaping teaching and teacher education, and the potential amplification of inequalities and injustices accelerated by the integration of AI. Our goal is to challenge the seductive allure of AIED as a form of revolutionary emergence in the context of education. Much of the teacher-related discourse arising since the launch of ChatGPT in 2022 has fluctuated between coping with the rapid onset of this new technology and the necessity to innovate and upskill in order to meet the needs of an educational system in need of transformation. However, along with promissory visions about AI's ability to transform educational practices, there is a genuine anxiety among the teaching profession and those in teacher education as to the response to this new technological incursion and the necessity to make sense of their practice (Stenberg et al., 2025). This is understandable given the technosocial landscape of contemporary life and the normalised acceptance of data extraction, consumerism and technological innovation within what Shoshana Zuboff names *surveillance capitalism* (Zuboff, 2019). The concept of surveillance capitalism, which centres the extraction, commodification and manipulation of personal data in order to influence human behaviour, provides theoretical context for our analysis, which, unlike theories such as 'technofeudalism' (Varoufakis, 2023) that see neoliberalism as being displaced, opens up space to consider the evolutions of late neoliberal phasing in education policy agendas (cf. Delahunty, 2024a), within the present era of AIED furore.

While much of the critical scholarship is situated within the general field of education, looking at the implications of AI for educational systems broadly, there is comparatively little emphasis on teacher education specifically. A recent special issue by Carrillo and Flores (2025) consolidates some of this emerging scholarship in AI in teacher education, signalling trending foci such as adoption, constraints and affordances, impacts on teacher identity, and ethical/political aspects (see also Carrillo et al., 2025). While ethics is represented as a significant focus, it is notable that most of the papers included are focused on discussions related to 'ethical use' with emphases such as 'data privacy, plagiarism, algorithmic bias, environmental impact, and academic integrity' (Carrillo et al., 2025, p. 1156). While this work does highlight the need to think about ethical concerns within broader sociopolitics and advocacy, this stops short of a critical consideration of the broader politics of AI which shapes the logics of 'inevitability' motivating the urgency for assimilation into current praxis. This ostensible urgency of adoption is deeply connected to the politics of inevitablism (Zuboff, 2019) replete within technocentric mutations of public life and policy, driven by the interests of BigTech. This presents concerns

for teacher education, and by consequence the profession, given tendencies toward compliance in ethical framings of AIED (Carrillo et al., 2025) and the relative lack of broader ethical awareness among teacher educators relating to these technologies (Moorhouse et al., 2024). Indeed, the technical treatment of ethical guidelines from intergovernmental organisations such as UNESCO (Mochizuki et al., 2025) may continue to reinforce such compliance mindsets.

It is imperative to situate these larger ethical issues within the broader politics of AI effecting change at the level of international and national governance in order to make sense of some of the uncertainties surrounding the possible impacts on teacher education. These include the very manner in which AI is now mediating political decision making itself, narrowing what is acceptable or intelligible discourse within the 'politics of the prompt' (Amoore et al., 2025). The uncertainty of AI has also been experienced among governmental levels, as shown by Af Malmborg (2023), who argues that entities such as the European Commission largely understand AI within a future-oriented discourse anchored within pre-existing political mobilisations, mutated through a shift, accelerated by the pandemic, towards the era of 'programmable politics' (Lindgren & Kaun, 2025). This challenges the supposed novelty of the present AI conjunction, inflecting the preexisting and adaptive politics associated with neoliberal evolutions, and a necessity to excavate these logics as a precursor to a 'critical ethics of AI', which, for example, could attend to the possibility of refusal or resistance.

The present work: Establishing our bearings

Naturally, it is difficult in this context for a teacher or teacher educator to find their bearings, to paraphrase Langdon Winner, who described the phenomenon of technological 'things' confounding our vision (Winner, 1978) and facilitating a passive acceptance of the inevitability of (technological) progress. We aim to establish some bearings in this complex discursive space and challenge the inevitablism of AI within teaching and education. In line with the present work which sees AIED as the present manifestation of a series of convergences affecting education in recent times, Sriprakash et al. (2024) position AI among a suite of sociodigital practices that are having a profound impact on the shape and direction of educational policies and values. This positioning highlights the inherent sociopolitical elements that are both impacted by and impacting the approach to AI in teaching and teacher education, and the necessity of a critical sociological approach to AIED and algorithms.

Moreover, in highlighting the contradictions between the promissory discourses of AI as a source of transformative good in education and the technology's tendency to reproduce significant biases and falsities, Williamson (2024) argues for increased sensitivity to the social and historical aspects of AI. Rather than being read as a novel manifestation of the 'inevitable' evolutionary progress of technology, the sociohistorical positioning of AIED can be viewed as the current trend in the broader politics of Big EdTech's growing influence over education. This has a much longer historical narrative within education and teaching and intersects with several significant sociopolitical phenomena (Williamson & Eynon, 2020) that have come to shape teaching and teacher education. Despite work that has argued for an increased historical sensitivity to the emergence of discourses surrounding AI, few in-depth

genealogical investigations exist which attempt to situate the ostensible novelty of AIED among the broader sociopolitical vectors underpinning its current momentum – a notable exception in the Swedish context is Rahm (2023). This is especially true in the case of teaching and teacher education, where few works have taken a critical look at how these politics may impact on the transformation of teaching and teachers. Therefore, in the present work we produce a novel genealogical reading of the current populism surrounding promissory visions of transformative AI to more critically assess its standing in relation to contemporary debates and reflections upon the response and direction that teaching and teacher education may take in the future. Motivated by critical studies on the politics of AI and its effects on governance and public policy, we ask the question of what political vectors have contributed to the emerging framing of AI in teaching and teacher education.

Our approach

In his extensive philosophical enquiries into the nature of power, Michel Foucault formalised his genealogical method to uncover 'singularities', closely related to his rejection of universals (Ball, 2013). In describing genealogical work, Foucault explains that it:

> . . . means making visible a singularity at places where there is a temptation to invoke a historical constant, an immediate anthropological trait, or an obviousness which imposes itself uniformly on all. To show that things 'weren't as necessary as all that'. (Foucault, 1991, p. 76)

The work of genealogy emerges from a refusal to treat historical analysis as a linear method of uncovering 'a timeless and essential secret' (Foucault, 1984, p. 78); rather, it looks to the broader complexities that give rise to apparently aeonic phenomena. This approach transcends a reduction to 'causes' for particular emergences and towards the analysis of sociohistorical material for problematising the present (Rahm, 2023). Put differently, for Foucault's genealogical method, the 'truth' cannot be cleaved from its own conditions of production. As Tamboukou (1999, p. 202) writes, 'genealogies pose the question of which kinds of practices tied to which kinds of external conditions determine different knowledges in which we ourselves figure'. Unlike other approaches, genealogical analysis does not comprise a strict procedural path and instead is said to name a critical orientation that seeks to question and problematise ostensibly secure foundations of knowledge. As Hook (2005, p. 7) states, '[t]he procedures of genealogy hope to produce counter-intuitive ways of seeing'. Through this form of analysis, the researcher is empowered to unsettle forms of power residing within 'official' discursive formations, through revealing the multiple conditions of formation that have facilitated their emergence (Dean, 1994). Genealogy then considers the historical emergence of certain discursive formations, such as AIED in this article, to be complex weaves of interrelated events that direct change in certain trajectories. This is critical to our goal of problematising some of the ostensibly prodigious onset of AI in education, as well as the concomitant politics, located in the emergence of generative models in 2022. The genealogical method we adopt allows us to challenge the novelty of these discourses while excavating some of the broader discursive political formations that have rendered intelligible mainstream discourses concerned with the transformation of education. Indeed, adopting

a Foucauldian genealogical method allows us to contest the 'aspectival captivity' (Lorenzini & Tiisala, 2024) imposed by the populist discourses surrounding AIED that restrict the capacity to think within this technological inevitability and open up spaces to contest the political effects for teaching and teacher education.

Importantly, while not a step-by-step-procedure, genealogy is no less rigorous than other methods, requiring 'a vast accumulation of source material' and commitment to 'relentless erudition' (Foucault, 1984, pp. 76–77). The genealogical method is concerned with the analysis of discourses and rigorous documentation (Tamboukou, 1999). However, these should be conceived broadly and in relation to the centrality in which the 'body' figures throughout Foucault's works where it presents as the surface of inscription for these broader forces (Ball, 2013). This focus on the body within the genealogical mode of critique is essential to understanding and mapping the implications of particular emergences of discursive formations. As Tamboukou (1999) argues, this orientates the researcher towards a definition of problem and the subsequent mapping of practices in their relation to the problem and its emergence within a *dispositif*; a complex 'heterogenous ensemble consisting of discourses, institutions, architectural forms, regulatory decisions, laws, administrative measures, scientific statements, philosophical, moral, and philanthropic propositions' (Foucault, 1980, p. 194). And names what is said as much as what is left unsaid (Foucault, 1980). This not only sketches the plane on which the object(s) of genealogical inquiry can act upon the individual, but methodologically highlights the eclectic scope of documentation one is required to draw upon in their analysis. Importantly, this renders genealogy as neither certain in the sense of allowing definitive analytical conclusions nor final in rendering satisfactory answers (Tamboukou, 1999). This approach, however, facilitates a novel and necessary insertion into what could be characterised as a naively optimistic historical epoch within teacher education, where proponents of AI are racing to determine suitable adaptations to practices.

We look specifically at the emergence of an ostensible inevitability of AIED within the broad field of teacher education, which can be tangibly observed in the recent publications of official guidance for the integration of AI into teaching and learning practices. Namely, we will look at some of the broader sociopolitical vectors that have had a bearing on the emergence of the techno-optimism and imperatives surrounding AIED. In drawing on a genealogical framing, we work both backwards and forward (Rahm & Rahm-Skågeby, 2023) in problematising some of the narratives surrounding the technology and draw implications for teachers and teacher education. The paper will proceed with an analysis of the neoliberal politics surrounding the field of educational technology and its corporate underpinnings (referred to as 'BigEdTech' hence forth), followed by considering the datafication of education as part of the phenomenon of precision educational governance. The final genealogical thread we follow will be centred on the official documentation emerging from intergovernmental organisations; namely UNESCO (2024) *AI competency framework for teachers*, OECD (2025b) *Preparing teachers for digital education*, and the OECD (2025a) *Introducing the AI Capability Indicators*. As our work here forms part of ongoing research, for the purposes of this article we will focus primarily on rationales and justifications for AI and its integration into teaching in the documentation as these exemplify the core politics associated with various stakeholders in this discursive and governance space. We draw upon a broad range of sources in our analyses of these threads encompassing official documentation (policies and reports; particularly

intergovernmental and BigTech sources), discursive media (news articles, press releases, blogs), and political discourse (parliamentary proceedings, statements encompassing national and international sources). We do not restrict our analyses in this article to a particular geographic region, primarily as our positioning of the genealogical threads here aims to understand the politics surrounding the emergence of 'official' discourse on AIED as it applies to teaching contemporaneously, associated primarily with documentation released by the OECD and UNESCO. The search was temporally conceived within the major emergence of the neoliberal era and hence restricted to 1980 onwards. Additionally, this also reflects the mobility of policy-making discourses that operate in ways that inflect the porosity of globalised and local forces within neoliberal societies. The full list of sources consulted for the present article is included in Appendix 1.

Novel, perhaps, but not new: AI as the present manifestation of neoliberal BigEdTech

As Williamson and Eynon (2020) observe, the contemporary AIED moment is a product of multiple genealogical threads and convergences that include, *inter alia*, the growth of the commercial education technology (EdTech) industry and the influence of global technology corporations on education. Big Tech actors' exertion of soft power in order to influence education decision-making is well documented (Selwyn & Gašević, 2020). In order to better understand the sudden incursion of generative AI into the education landscape, the ideological backdrop against which technology more generally has come to feature so prominently within educational policy discourse and practice needs to be considered. The ascendancy of neoliberalism as a 'world-making project' in the latter decades of the twentieth century (Bell, 2013, p. 267) has significantly shaped both the global economic architecture and the global educational governance landscape by increasing the reach of privatised interests and politics in the public education arena (Verelst et al., 2025). Understood here as a paradigm that extends market-based and efficiency-oriented reasoning to all domains of social life, neoliberalist ideology perceives technological change as both inevitable and desirable, and critical to ensuring a high-growth, knowledge-based economy (Critch, 2024).

Within education, neoliberalist ideology is perhaps most evident in the proliferation of technosolutionist discourse espousing digital technology's transformative potential for student learning, increased inclusion, and equity (Linderoth et al., 2024; Mochizuki et al., 2025). The 'industrial logic' underpinning the promotion of EdTech has been critiqued as far back as the early 1980s. For example, Henri Dieuzeide (1982) – who served as UNESCO Director in charge of educational technologies between 1967 and 1984 – described decision makers, researchers and users of EdTech as being 'caught between the [EdTech] merchants and the prophets in a field where industrial innovators propose solutions whose problems have yet to be invented' (cited in Mochizuki et al., 2025, p. 16). Dieuzeide critiqued the presentation of innovation as inevitably socially progressive, characterising it as part of an 'industrial logic with no reference to social objectives' (cited in Mochizuki et al., 2025). As this neoliberal ideological framework intensified as the twentieth century progressed it paved the way for the emergence of BigTech and EdTech 'super policy entrepreneurs' (Khanal et al., 2025) who have established themselves as key actors in the education policy process, with major implications for education's socially

transformative agenda. Big/EdTech's increasing influence over the educational policy landscape is alarming, not least because their industrial logic, business models and algorithmic architectures – all of which are designed to optimise and incentivise engagement – have a detrimental impact on, *inter alia,* mental health and wellbeing, democracy, knowledge, equality, human rights and planetary sustainability. Variously promoted under the guise of enhancing educational efficiency, equity or outcomes, personalised learning and associated AI-driven technologies, for example, reduce education to *learnification* (Biesta, 2005), thereby displacing the political, cultural and institutional complexities of schooling and hollowing out its purpose as a public good (e.g. Williamson et al., 2026). These conditions of digital educational privatisation produce an atomised, depoliticised vision of education, diminishing more holistic understandings of schools as sites of belonging and collective political agency. Unable to replicate what teachers *actually* do in classrooms – including the transformative connective labour they perform (Pugh, 2024) – these technologies fundamentally alter teacher-student engagement as well as the conditions under which knowledge is produced.

Take the 'Google for Education' platform, for example, which, in an ostensibly altruistic sentiment, presents the case for 'educators and learners' who 'deserve the tools and skills that set them up for success' (Google, 2025). Its webpage lays out the company's 'commitment' to education, including '[t]urning bus time into learning time', via connectivitity infrastructures that can 'help thousands of students in rural communities access more learning hours outside of school' (Google, 2025). While infrastructural inequalities do clearly impact on educational attainment, Google's 'commitments' are to extending the traditional confinements of schools towards increased learning time *outside* of school via online connectivity, reflecting a desire for perpetual online engagement and expanding the economies of scope, consistent with enhanced opportunities for the extraction of behavioural data for economic growth (Zuboff, 2019). This perspective helps to situate the present discussion on the emergence of generative AI systems, such as ChatGPT, as part of the larger neoliberal EdTech assemblage.

The direct effects of the encroachment of these neoliberal forces can be seen in the proliferation of monetisation practices through which private industry sells or rents access to their digital products in the form of corporate rentierism (Komljenovic, 2021). Corporations provide certain schools designation or certification, where programmes such as *Microsoft Dreamspace* or *Apple Distinguished Schools*, can portray their ostensibly noble intentions for public education. Of course, such moves provide a public image of the corporation as socially responsible, but, as has been pointed out, the commercial undercurrent almost always flows to influence students and wider stakeholders within the scope of consumer capitalism (Cone & Lai, 2025). Aligning with Foucault's discussion of the governing potential of neoliberalism as a 'principle of intelligibility and a principle of decipherment of social relationships and individual behaviour' (Foucault, 2008, p. 243), we can observe how the corporate infiltration of public education moves beyond mere infrastructural support to a force of subjectivation. Consider the general justifications companies such as Apple give for their 'investments' in educative areas that typically mobilise tropes of 'eliminating inequality' or enhancing learning 'innovation'. Lisa Jackson, Apple's Vice President of Environment, policy, and Social Initiatives, recently described the company as having 'always believed in the power of education to open new doors and give people the tools they need to build a better, more equitable world' (Apple,

2024). Jackson goes on to state 'We're blown away to see how tomorrow's coders, creators, innovators and leaders using Apple technology and resources to make their impact known' (Apple, 2024). Not only does the sentiment attempt a conflation of technological access with opening up equalities, but the innovation is directly tied to Apple products in Jackson's view, and their capacity to make a student's innovation known to the world. In this example, students' capacity for innovation is rendered dependent upon digital technology, thus elevating the necessity of the product within the sociotechnical imaginary of surveillance capitalism. Foucault also provides specific critique of the politics of innovation, citing its use to reverse or slow declining profits.

> If there is innovation, that is to say, if we find new things, discover new forms of productivity, and make technological innovations, this is nothing other than the income of certain capital, of human capital, that is to say, of the set of investments we have made at the level of man himself. (Foucault, 2008, p. 231)

We therefore render visible, with this genealogical lens, EdTech innovation, within both a Foucauldian and surveillance capitalism perspective, as inherently tied to the logics of value extraction and the future-proofing of economic growth potential. The sources analysed here are representative of the larger neoliberal corporatisation of education highlighted across various literatures (Cone & Lai, 2025; Williamson, 2018). In the first instance, we acknowledge the incursion of generative AI into the educational landscape in late 2022 as occurring within this neoliberal and surveillance capitalism era, and with significant encroachments into education already underway.

While early discourses centring on the introduction of generative AI teetered between economic benefits and risks to certain demographics of the workforce, those discussing its acclaimed benefits for education centred on ideas such as personalised and continuous learning. OpenAI, the company that owns ChatGPT, feature an article with Lilian Weng from December 2022 entitled 'the power of continuous learning' (Open AI, 2022). Weng, an applied AI researcher, when asked about what excites her most about the future of AI, suggests that it 'should outperform humans at most economically valuable work', echoing the automaton vision for the technology. She goes on to argue that in helping human society, AI will '[f]ully automate or significantly reduce human efforts on tasks that are repetitive and non-innovative' in order to 'drastically boost human productivity'. Again the politics of innovation emerge in this narrative along with the capitalistic trope of productivity, which leverages a temporal power to render more and more of human activity within an extractive cartography. Within this narrative we can also see how the emergence of openly available GenAI is being mobilised to render certain human activities – and by association certain bodies – as obsolete within this digital timescape, reflecting a new insertion of traditional-contemporary binaries within the broader narratives of progress. Therefore, this not only inserts the technology as an aid to humanity but also facilitates a governing logic which elevates some capacities while devaluing others in a complex assemblage that seeks to mould 'desirable innovative' human subjects. Although much of OpenAI's rhetoric claims its interest in benefitting all of humanity and remaining a capped-profit company, its largest investor, Microsoft, cannot be said to hold a similar structure. In announcing the extension of their partnership in January 2023, OpenAI claims Microsoft shares their altruistic values. The company goes on to cite their reliance and structuring on Microsoft Azure's platform, for 'delivering best-in-class

performance' (Open AI, 2023). It adds that 'learning from real-world use . . . is a critical part of developing powerful AI systems' and 'in [the] effort to build and deploy safe AI systems' (Open AI, 2023). The socially interdependent nature of AI, as viewed by the company, is notable in these claims, along with the appeals to a form of ethics through 'safe' use. This, of course, is vulgarly ironic in the context of Microsoft – who OpenAI claim shares the same values – given their supply of the Israeli defence forces with AI technology in support of the genocide of the Palestinian people in Gaza (Davies & Abraham, 2025). This cannot be reduced to a simple claim of the misapplication of technology as it is clear that what is being leveraged here is a rhetoric centred on the values of AI for humanity.

Many of the techno-optimistic sentiments concerning AIED elide the fact that this technology was not created for educational purposes, reflecting its corporate and even military genesis (Ebben & Murphy, 2025; Widder et al., 2024). Overtly manifesting the corporate interest in personalised learning, Sal Khan (founder of the Khan Academy), who in addition to his online 'free' learning platform owns a private school in Silicon Valley, struck a deal with OpenAI in 2023 to integrate its technology with his company in order to provide a 'fairly compelling tutor' (Staton & Murgia, 2023). He goes on to say that 'it's probably the biggest transformation of our life . . . especially in education' and cautions that it can be misused so therefore educational integration must be 'pedagogically sound, with clear oversight and moderation filters' (Staton & Murgia, 2023). This stance clearly individualises the ethical concerns with AI in education, placing responsibility on educators and conversely its misapplication as a result of poor pedagogical practices. These politics, rather than being novelties associated with AIED, can be read as the continuing effects of neoliberal instrumentalism that have eroded teacher professionalism through heightened performative accountabilities (Ball, 2015) and with the governance of subjectivities to serve economic interests. The claimed advantages proponents of AI continue to embrace, such as flexible and lifelong learning enhancements, can be read as supports for the continued internment of teachers and students to the neoliberal matrix of production (Delahunty, 2024b). While this section has analysed the inherent corporate foundations that have shaped and continue to shape AIED, its potential to further intensify the neoliberalisation of education and ultimately serve surveillance capitalist interests builds upon the phenomenon of datafication.

Extractive datafication and precision governance as techno-pedagogic potential

Perhaps the most famous unveiling of the power and politics associated with the accumulation of vast quantities of personal data was when the whistleblower Edward Snowden, in 2013, exposed the routine practices of the National Security Agency in the United States, which intercepted billions of data interactions across various tech platforms (Greenwald et al., 2013). This was more than a wakeup call to the public (Van Dijck, 2014) who were used to trading personal data through various digital platforms, as it was now clear that their data were being traded beyond commercial rationales by corporations. The core issue here lies in why it took such an event to spark public concern and clearly demonstrates the normalisation of data extraction which has come to characterise users' contact with digital platforms. The drive to capture data across all forms of social life is based on its necessity for commercial, technological and political goals (Sadowski, 2019).

Datafication, which rests on the assumption that every aspect of social life should be transformed into data (Magalhaes & Couldry, 2021), is a well seated component of the neoliberal era of education operating as an influential and often tacit force in policy discourse and reform (Delahunty, 2024b).

The means through which data are constructed or extracted are typically eschewed in claims motivated by the apparent necessity of using data to enhance student learning. For instance, also in 2013, the chief technology officer of ConnectEDU, a company that provides technology solutions to school and colleges, was quoted in a *Financial Times* piece on technology being the key to teaching future skills, about the the necessity of data to forecast student performance: 'By using data to evaluate students in real time and applying predictive algorithms, educators can drive more targeted curriculums. This should allow earlier interventions to ensure that students are on track to meet whatever measures of success exist' (Taylor, 2013, n.p). While the constructed naturalness of data underpins the 'real-time' framing of performance, there are clear intentions at predictive moulding of students towards 'targeted' curricular intentions. Further, the use of language such as 'real time' and emphasising capacities for earlier intervention emanate a politics of temporality, where data will facilitate not only more effective interventions but more efficient ones. At the same time these temporal narratives work to invoke a vision of education as in need of futurising.

These vectors emerge within political debates on education and a recurrent necessity for reform, often based on some underperformance on international benchmarking exercises (e.g. PISA), or from corporate sectors. In 2014, this is exemplified in parliamentary debates in the Irish context, where Simon Harris (current Tanáiste/Deputy Prime Minister) argued: '[w]e need to re-examine our education system' (Dáil Eireann, 2014, p. 85). He goes on:

> People used to ask what the business language of the world was and someone would suggest that it was French or Chinese. Another language of business in the world now is coding … teaching people how to type on a word processor in schools has nothing to do with the knowledge economy. (Dáil Eireann, 2014, p. 86)

The obvious corporate themes aside, the evocation of 'coding' as a new language for business and the necessity to centre this within debates, from a then minister and now former Taoiseach/Prime Minster of Ireland, on public education demonstrate the power of the datafied policy modality core to contemporary governance. This modality refers to constantly expanding data infrastructures which coalesce with automated management systems that synthesise vast amounts of statistics drawn from behavioural data in order to inform current and future practices (Williamson, 2017). Here not only is data positioned within a politics of temporality but it is also leveraged to direct the content which will enable students to manipulate data in their future working lives (coding).

The ostensible transformation offered within these datafied cartographies ultimately lead to alternative visions of the process of learning and consequently the role of the teacher. The publication of the US Department of Education's report *Enhancing Teaching and Learning Through Educational Data Mining and Learning Analytics* (Bienkowski et al., 2012) sharply highlights this. The report represents a substantive attempt at elevating the concept of personalised learning (Roberts-Mahoney et al., 2016) by drawing on exemplars such as Netflix and Amazon to demonstrate how consistent user engagements result in

more refined patterns of suggestion, based on preferences and behaviours. This is further extrapolated to education:

> Imagine an introductory biology course. The instructor is responsible for supporting student learning, but her role has changed to one of designing, orchestrating, and supporting learning experiences rather than 'telling.' … the instructor elaborates and communicates the course's learning objectives and identifies resources and experiences through which those learning goals can be attained. (Bienkowski et al., p. 5)

Teaching here is denigrated to the practice of delivering information and hence the role can be transformed through datafied logics to that of identifying resources or experiences for the student to, presumably, engage with personally. Roberts-Mahoney et al. (2016) have analysed this as a form of standardised customisation or 'digital Taylorism' (p. 416) but these visions for teaching and learning resound across many jurisdictions within this genealogical thread. In the UK, Sir Anthony Seldon, a political commentator and author of *The Fourth Education Revolution*, is quoted as saying that teachers will become 'classroom assistants, remaining on hand to set up equipment, help children when necessary and maintain discipline' when he spoke at the British Science Festival in 2017 (Hoppe, 2017). This could perhaps be explained away as optimistic or even utopian thinking, but is somewhat understandable when we consider that in 2016, a robotic teaching assistant named Jill Watson worked to tutor students in an online course at Georgia Tech with them apparently not noticing their robotic character (Georgia Tech Professional Education Communications [GTPE], 2016). Dr Tarek Besold's talk from the 2016 OEB educational technology conference in Berlin featured the Watson case where he extoled the quality of the artificial tutor in supporting students, in particular citing the rapid responsiveness to student queries as a core advantage over traditional teachers (Coughlan, 2016). Here again the mobilisation of temporal politics are evident in utilising artificial tutors and data inputs from students for personalised feedback. The potential for these automated transformations of teaching and learning are rendered intelligible within the complex of datafication, which predate the emergence of generative AI within our present landscape.

The logics of datafication, which constructs and extracts data as 'naturally' occurring and ripe for collection and analysis, reflect the coloniality of contemporaneous digital and AI landscapes (Couldry & Mejias, 2019). A blog post from the Microsoft Education Team (2022) titled '*How data and AI are changing the world of education*' makes the case that 'Artificial Intelligence (AI) enables data holders to transform a passive resource into a powerful catalyst for accelerated growth'. Here the apparent naturalness of data continues to be positioned as a powerful source of capital – for those who hold it – which 'the education sector had been relatively slow to embrace', again constructing a sentiment of backwardness and reflecting the narratives of necessary progress that excoriate 'traditional' practices; a key component of coloniality (Smith, 2012). Datafication, supported by the rise of advanced technologies and a strengthened scientism within public policy-making (Ezrahi, 2012), augments the evidence-based ideologies imputed within the broad field of education and teaching, feeding from and enhancing temporal anxieties underpinning the discourses surrounding BigData technologies.

As Delahunty (2024a) has shown, these forces achieve optimal effect through these politics of 'eternal disequilibrium', leveraging narratives of crises to suspend typical

democratic processes, powering over policy decisions often in the service of preserving economic growth and associated elite privilege (Blyth, 2013; Klein, 2007). The cultivation of public anxieties of time (Southerton & Tomlinson, 2005) works to accelerate policy reforms as solutions to antiquated practices (Kitchin, 2019), and severs historical and contextual phenomena within a miasma of abstracted data-driven policy decisions that serve particular interests (Kitchin, 2023; Pollitt, 2008). This is also reflected specifically in educational policy over time which has shifted from a values focus to one of 'policy by numbers' (Ball, 2015; Lingard, 2021). These politics unfold prior to, and in conjunction with, the emergence of GenAI in education and form another genealogical underpinning inflected through contemporary policy emergences. Consider the foreword to the *OECD Digital Education Outlook 2023* (OECD, 2023), which argues that a 'digital transition in education has been underway for decades but accelerated significantly during the COVID-19 pandemic' (p. 3). The positioning of the historical growth of digital education and the 'crisis' of the pandemic are used as context prior to arguing that this transition does not equate to transformation:

> The latter would imply a fundamental change in some educational processes, integrating technology not just as a tool, but as a way to reshape teaching methodologies, learning processes, and the educational ecosystem at large, to make it more effective. Currently, the incorporation of technology in education often replicates traditional methods rather than reinvents them. (OECD, 2023, p. 3)

Here we see the multiple ways in which temporal power operates to again situate digital and data practices as the viable path to enhancing education towards more effective formations. The foreword goes on to denounce the '[p]rivacy concerns and a lack of data linkages' across different contexts that impede the collection of further data on stakeholders 'to be translated into actionable information' (OECD, 2023, p. 3). The implication here being that there should be no concern for 'naturally occurring' data that only need to be networked into greater linkage within a datafied governance assemblage. The politics of datafication have created the conditions where the emergence of GenAI in education seems inevitable and linked with tropes of progress. These same temporal powers that construct educational practices as antiquated and in need of technological boosting operate on the construction of teaching and teacher education in similar manners.

Transforming teachers: The emerging policy

Thus far we have explored the corporate developments and influences that have accompanied the emergence of AIED, highlighting the extractive intent of the technology and its use in the globalised network of surveillance capitalism. The article has also explored the politics of datafication, drawing key concerns for the temporal power mobilised within the neoliberalisation of education that shift and modulate educational policy work, with the overarching effect of a techno-solutionist moulding of educational futures. While sources aligned with our genealogical approach have necessarily been diverse, working with historical and more recent sources, the core influence of intergovernmental organisations and BigEdTech are notable in the examples we have analysed, with recurrent themes of rescuing an outmoded education with promises of datafied and AIED transformations. These observations align with

previous literature that has demonstrated the neoliberal technosolutionism framing AIED among organisations such as the OECD, UNESCO, UNICEF and the World Economic Forum (Linderoth et al., 2024; Mochizuki et al., 2025). In unfolding these genealogical threads, we can begin to understand the emergence of hype surrounding AIED in late 2022 which leads us to the current landscape of policy and debate surrounding how teachers and teacher education should 'adapt'. The influence of intergovernmental organisations' policy constructions, through 'soft governing' that evades typical democratic due process, cannot be understated (Mertanen et al., 2021) and enter onto the scene at a time when teachers' anxieties and desire for official guidance are heightened.[2] For these reasons our analysis turns to the rationales underpinning 'official' guidance produced by intergovernmental organisations, namely the OECD and UNESCO, which represent more recent elements of the genealogies underpinning current AIED momentum.

The OECD (2025b) has published guidance on *Preparing Teachers for Digital Education* which targets teacher education via continuous professional learning. The document cites the COVID-19 pandemic as the reason for 'the accelerated digital transformation of education' and exclaiming that '[a]bove all, teachers play a critical role in shaping students' education outcomes in increasingly digital learning environments' (OECD, 2025b, p. 6). The familiar construction of student success as dependent on effective teaching and within the framing of temporal anxieties fixated on digital transformation are clear. These temporal anxieties feature in specific guidance on AIED from the OECD's (2025c) policy paper on *What should teachers teach and students learn in a future of powerful AI?* The document summarises the main themes emerging from writing about AIED as concerning 1) using AI to improve teaching, learning and assessment; 2) identifying and preventing risks of AI usage; 3) adapting curricula to incorporate AI literacy (OECD, 2025c, p. 1). Of course, this summing up of general themes, apart from being questionable, does not attempt to address any inherent dangers or injustices with the technology itself, again reducing threat down to misuse. It goes on to invoke the inevitable changes AI will bring to the world which will 'reshape how humans carry out work and life tasks' and arguing that the 'knowledge, skills and attitudes promoted through education might need to change' (OECD, 2025c, p. 1). Interestingly, the introduction also goes on to raise past EdTech evolutions in education, such as 'search engines' which also led to debates about the 'value of transmitting factual information' as comparative cases to AI, which promises to have an impact 'several degrees of magnitude beyond these examples' (OECD, 2025c, p. 1). The framing of AI as simultaneously an unimaginable impact on education and something as trivial as today's accepted benignity of a search engine provides an example of double speak, which imputes the logic of crisis (brought on by actual crises such as COVID-19), and at the same time constructing AI as something 'natural' in terms of educational progress, which teachers will need to adapt their practices to. The representation of search engines as vehicles to access factual information not only resonates with the technicist presentation of AI as merely a mechanism to access data (see also UNESCO, 2024), but also elides the core role that search engines played, and continue to play, in the monetisation strategies of BigTech (cf. Zuboff, 2019). This is also not to mention the conflation of information access with learning and knowledge that underpins the logics of AIED (Costa & Murphy, 2025). The OECD is again exerting its influence towards the shaping of a future of teaching that is centred on the

integration of AI into teachers' pedagogical practices, which can (or need to) be enhanced. AI is therefore represented as a solution to outmoded pedagogical practices and expertise.

The OECD and its politics of advancing evidence-based and precision governance have been well analysed in the literature (e.g. Sellar & Lingard, 2014), but the recent publication *Introducing the OECD AI capability indicators* (OECD, 2025a) features a foreword from Andreas Schleicher that presents further insight on these politics within an AIED frame. The document represents a 'beta' version of the OECD's framework for measuring AI systems capabilities. Schleicher argues that in comparison to the significant level of discourse on how AI can alter 'the delivery of education', there is little focus on 'what students should learn to complement AI capabilities effectively' and consequently public policy needs to 'take an active role to anticipate the evolution of AI capabilities' (OECD, 2025a; Foreword). Not only is there the exercising of temporal power here in raising issues relating to anticipatory effects of AI, but Schleicher is clearly positioning AI as the priority for the OECD, signalling the notion that humans should base their development on its potential. This is not surprising given Schleicher's known adherence to a positivistic evidence-based model of governance for education (cf. Delahunty, 2024a) but this arguably represents the intensification of these politics in recent official discourse. The Foreword continues:

> The indicators will enable ministers to discuss the implications of AI for the future of education – from curriculum design to pedagogy. This will involve how to configure space, time, people, technology and relationships in education in order to create the kind of learning environment that will educate learners for their future, not our past. (OECD, 2025a; Foreword)

Again the rhetoric of an outmoded education system is deployed to urge policy-makers in education to 'configure' learning environments; a sentiment steeped in instrumental language, demonstrating the continued technosolutionist stance of Schleicher and the OECD (Elfert, 2023). This technicisation of education and teaching manifesting in the OECD's latest narratives on AIED are not the only entries into our present landscape.

UNESCO (2024) published the *AI competency framework for teachers*, which continues the urgency for transformation. Arguably more steadfast than the OECD documents considered here, it claims that 'AI has transformed the traditional teacher–student relationship into a teacher –AI–student dynamic' (UNESCO, 2024; see Summary). The rationale for the production of the framework draws upon the positive framing of AI as a data processing and predictive technology that 'can facilitate human decision making' and delineates that '[e]merging practices in the use of AI in education clearly demonstrate the potential of AI to enable new forms of teaching learning and education management' that will enhance teachers' practices (UNESCO, 2024, p. 13). However, the discourse is not entirely techno-optimist with warnings that 'AI may threaten human agency, intensify climate change, violate data privacy, deepen long-standing systemic inequalities and exclusion' (UNESCO, 2024, p. 13). Ostensibly occupying a 'balanced' position, it is noticeable that the language is softened somewhat with qualifiers such as 'may', which again harks back to ideas of misapplication or poor ethics rather than any inherent structural issues. While the document goes on to warn about some of these dangers including data extraction, climate damage, and social injustices, these warnings are somewhat backgrounded by the tacit imperative for teachers to use AI which, is 'adaptive to diverse

problem spaces . . . [and] offer general-purpose foundation models that have the potential to drive transformation across various sectors' (UNESCO, 2024, p. 15). This imperative is then directed towards those supporting teachers' education: 'This more fundamental and controversial technological advance heightens the urgency of empowering teachers to understand the ethical issues related to interacting with various AI tools in their teaching, in order to ensure safe and responsible use among students' (UNESCO, 2024, p. 15). The idea that, presumably, teacher education must 'empower' teachers to safely interact with AI tools in their practice continues the tacit inevitability of the transformation of education and further responsibilises teacher educators with safeguarding ethical use of AI. Moreover, these imperatives are underpinned by UNESCO's foregrounding of the 'clearly' evidential benefits of AIED, despite the fact that this evidence base is at best overstated, with authors such as Tuomi (2025) demonstrating significant flaws in supposedly robust evidence on the benefits of AI for teaching and learning.

Concluding discussion: The politics of 'ex-machination'

Using a Foucauldian-inspired genealogical framing, this paper has presented an analysis of some of the key forces operating within education that have culminated in the latest emergence of 'official' discourse and guidance for integrating AI into teachers' practices. We have argued that AIED can be viewed as the latest manifestation of the neoliberal transformation of education via BigEdTech and the corporation, with the automated potentials of the technology possibly intensifying these logics. The technicisation of pedagogy via the transformative urgencies of intergovernmental organisations and their claims that teachers need to change their practices to fit the new AI landscape represent the potential for a growing thoughtlessness in teaching (Costa & Murphy, 2025). AI follows the genealogies of BigEdTech and datafication and is constructed within the present policy era as both a naturally occurring consequence of technological progress, and a transformative opportunity to progress teaching and learning from their outdated natures. This is the feature which we name as the *politics of ex-machination* of teaching drawing upon the derided use of *deus ex machina* as a plot device from Nietzsche's (2003) critique of the genre of Greek tragedy. Nietzsche derided the use of this tactic as it represented an encroachment of 'cheerfulness' as a means of alleviating the tragic conclusions of these tales, ultimately inserting a false sense of metaphysical consolation that are often not reflective of the complexities of material realities. Nietzsche's criticism is apt to our consideration of politics surrounding AI, as well as the undercurrent genealogies elided in its apparent emergence, as he criticised the manner in which knowledge societies had displaced the role of 'Dionysiac' music, emphasising instead the

> . . . god of machines . . . recognised and used in the service of a higher egoism; it believes in correcting the world through knowledge, in a life guided by science, and thus . . . in a position to confine the individual man in the narrowest circle of soluble problems . . . (Nietzsche, 2003, pp. 61–62)

Consequently, the ex-machination of teaching facilitates both an apparently desirable means of addressing the outmoded nature of teaching and learning practices engaged by teachers, and recasts their role within datafied cartographies to facilitators of instrumental techno-pedagogies.

Apart from the potential for further instrumentalising practice and pedagogy in teaching, the treatment of ethics in these documents follows a technosolutionist thread, already established in the critical literature (Mochizuki et al., 2025), representing the encroachment of this gaze upon teaching and teachers. Aside from an overreliance on regulatory policing as an ethical norm for AIED, there is an individualising of ethical responsibility onto the shoulder of educators in these policy discourses. This is not new to the self-responsibilisation tactics of neoliberal governance (Lynch, 2022) but as our paper has shown, there is now a clear responsibilising of teachers and teacher education with proper ethical use of the technology. This mirrors the broader treatment of ethics as a matter of comprehending the technicalities of AI in research on AI literacy (Sperling et al., 2024). Consequently, there is no mention in any of these official discourses of the inherent violence of AI based on its racialising, ableist, gendered, fragmentary and eugenicist tendencies that are built into the sociopolitical relations inherent in the data it requires (Dixon-Román et al., 2020; McQullian, 2022) or its tendency to amplify fascist beliefs (Kitchin, 2023). Mochizuki et al. (2025) make the point that prevailing policy constructions do draw upon ostensibly critical considerations of ethics, but that these are backgrounded as part of a strategy to present these documents as more nuanced, hence authoritative, on the inclusion of AI in education.

These 'politics of ex-machination' are increasingly difficult to observe amid the temporal power that supports discourses of necessary transformation of education. Along with the naturalisation of datafication amid the coloniality of everyday digital connections (Couldry & Mejias, 2019), AI is constructed as a natural consequence of technological progress and inevitable. This is core to surveillance capitalism where 'intelligent machines' are treated as inevitable unfoldings, eliding the socially infused construction of algorithms and their reproductive potentials through mining the depths of human experience and nudging users to desired subjectivities. These 'politics of inevitabilism' are particularly insidious as they give the appearance that nothing is to be done by teachers, except adapt to the new educational reality of AI. However, realising that this is a political force is the first step of resistance. As Shoshana Zuboff writes:

> Every doctrine of inevitability carries a weaponized virus of moral nihilism programmed to target human agency and delete resistance and creativity from the text of human possibility. (Zuboff, 2019, p. 224)

There is a possibility to reject inevitabilism and we argue that current discussion within teaching and teacher education communities need to consider this. The emerging discussions on AI literacy in teaching, for example, offer space to inform a human-centric ethical approach to the use of AI, but there must also be the potential for refusing AI and the naturalness of data. In relation to the devaluation of ethics that we have analysed, teaching and teacher education also need to realise the intensified logics of individualisation that are at work in policy discourse, as well as with the trope of personalised learning, and forefront relational pedagogy as essential. The politics of ex-machination of teaching works on the neoliberal practices of narrowing the purposes of education and it is essential that teacher educators open up the space for expanding these discussions as part of their potential work with AI, and where necessary, refuse it. This could take, for example, a more proactive construction of ethical guidelines that may as necessary reject the core ethical constructions in these official documentations at school level. This also applies to any

governmental consideration of national-level practices where it is critical that space is held open for debate on the generation of policy relating to AI use in contemporary schooling, and necessarily contesting the aspectival capture that is core to the politics of ex-machination at work in these neoliberal globalised policy landscapes. As McQullian (2022, p. 115) argues, 'care acts as an epistemological corrective to AI', and it is essential this is prioritised in considerations of its implementation within teacher education.

Notes

1. AI is an umbrella term concerning technologies of data synthesis, statistical analysis and prediction built upon machine learning, neural networks across education and teaching and facilitated by the intensive datafication of social life (McQullian, 2022).
2. https://www.newstalk.com/news/lack-of-ai-guidance-risks-a-cohort-of-teachers-being-left-behind-2191245.

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Appendix 1

Genealogical Thread	*Sources*
Thread 1: Neoliberal BigEdTech	Apple. (2024, October 1). Apple launches new professional learning resources for teachers and expands global education grant program [Press Release]. https://www.apple.com/ie/newsroom/2024/10/apple-launches-new-resources-for-teachers-expands-education-grant-program/ Google. (2025). Helping expand learning for everyone. Retrieved August 30th from https://edu.google.com/our-values/our-commitment/ Open AI. (2022). The power of continuous learning. https://openai.com/index/the-power-of-continuous-learning/ Open AI. (2023). OpenAI and Microsoft extend partnership. https://openai.com/index/openai-and-microsoft-extend-partnership/ Dieuzeide, H. 1982. "Marchands et Prophètes en Technologie de L'éducation." In Actes du Colloque:Les Formes Médiatisées de la Communication Educative. Saint-Cloud, IDF, France: École normalesupérieure de Saint-Cloud, 78–82. https://edutice.hal.science/file/index/docid/29261/filename/dieuzeide82.pdf.
Thread 2: Datafication and Governance	Microsoft Education Team. (2022, April 7th). How data and AI are changing the world of education. https://www.microsoft.com/en-us/education/blog/2022/04/how-data-and-ai-are-changing-the-world-of-education/ OECD. (2023). Digital Education Outlook 2023: Towards an Effective Digital Education Ecosystem. OECD Publishing. https://doi.org/10.1787/c74f03de-en Dáil Éireann. (2014). Parliamentary Debates. Dublin Retrieved from https://data.oireachtas.ie/ie/oireachtas/debateRecord/dail/2014-03-13/debate/mul@/main.pdf Taylor, P. (2013, July 17). Technology is the key to teaching future skills. Financial Times. https://www.ft.com/content/046813bc-e301-11e2-bd87-00144feabdc0 Bienkowski, M., Feng, M., & Means, B. (2012). Enhancing Teaching and Learning Through Educational Data Mining and Learning Analytics: An Issue Brief. Washington D.C Retrieved from https://files.eric.ed.gov/fulltext/ED611199.pdf Hoppe, C. (2017). Robot Teachers In 10 Years: Says Top UK Educator. https://whichschooladvisor.com/uk/school-news/robot-teachers-in-10-years-says-top-uk-educator#:~:text=Created%20with%20Sketch.,to%20be%20published%20next%20year. Georgia Tech Professional Education Communications [GTPE]. (2016, Jnuary 16). Meet Jill Watson: Georgia Tech's first AI teaching assistant. Professional Education: College of Lifetime Learning Blog. https://pe.gatech.edu/blog/meet-jill-watson-georgia-techs-first-ai-teaching-assistant OEB Conference. (2016). OEB 2016 - Where Does AI Leave Us? - Tarek R. Besold. https://www.youtube.com/watch?v=KPOsEvNrpUs Coughlan, S. (2016, December 14). Could robots be marking your homework? BBC News. https://www.bbc.com/news/business-38289079
Thread 3: Transforming teachers	OECD. (2025a). Introducing the OECD AI Capability Indicators [Report]. https://doi.org/10.1787/be745f04-en OECD. (2025b). Preparing teachers for digital education: Continuing professional learning on digital skills and pedagogies [Policy Paper]. OECD Education Policy Perspectives, 122. Retrieved July 29th 2025, from https://www.oecd.org/en/publications/preparing-teachers-for-digital-education_af442d7a-en.html OECD. (2025c). What should teachers teach and students learn in a future of powerful AI? [Policy Paper]. OECD Education Spotlights, 20. Retrieved July 29th, 2025, from https://www.oecd.org/en/publications/what-should-teachers-teach-and-students-learn-in-a-future-of-powerful-ai_ca56c7d6-en.html UNESCO. (2024). AI competency framework for teachers. UNESCO.