P

Postdigital Education

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Abstract

Postdigital education involves a critical perspective on the integration of digital technology in education, and encompasses considerations of technology, pedagogy, biology, politics, economics, the environment and, crucially, social justice. It positions all educational situations as emerging from complex combinations of digital, social, and material activity. This conception supports educators to take up critical perspectives on the datafication of educational activity and to question the implications of data-driven practices for diverse groups of people, paying particular attention to those who are marginalised. This implies a need for awareness of ethical considerations, labour conditions, corporate interests, environmental harms and other political-economic concerns. It also implies a need for collective, transdisciplinary work in shaping education towards shared values such as inclusion, care, and social justice.

Keywords

Postdigital · Postdigital Education · Design · Determinism · Social Justice · Datafication

Introduction

Postdigital education encompasses considerations of technology, pedagogy, biology, politics, economics, social justice, and the environment (Jandrić et al. 2018). By considering connections between these elements, postdigital education aims to provide a more holistic and critical perspective on educational practices that goes beyond a narrow focus on digital tools and platforms.

From a postdigital view of education, teaching, learning, and assessment practices are so entangled with digital technology that it no longer makes sense to distinguish between digital and non-digital forms of education. For some, this is suggestive of a period of time in which digital technology has become so pervasive that its involvement in education is no longer noteworthy (Cramer 2015). However, some other scholars argue that there is no clear 'digital revolution' (Pepperell and Punt 2000) or point at which such a time period began (e.g., Feenberg 2019). Instead, a postdigital view may suggest that digital activity has always, at least since the invention of digital technologies, been inseparable from the analog world. Therefore, postdigital education need not be restricted to more obviously

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technology-related contexts, such as online learning or 'technology-enhanced learning', but can be applied to any form of education. For example, a postdigital perspective has been taken on outdoor education (Reed 2022) and physical education (Wallace et al. 2022).

At a philosophical level, postdigital education also differentiates itself from other technology-related fields of education (e.g., technology-enhanced learning or e-learning) in its fundamental rejection of reductive views of the relationship between technology and social change. Such views include technological determinism, where technology is the driver of change (Kaplan 2009); and 'human determinism' (Berg 1998), 'use determinism' (Kanuka 2008), or 'pedagogical determinism' (Anderson and Dron 2011), where people use tools and technologies to drive change. Postdigital education also entails a rejection of essentialism, an understanding of technology as embodying unchangeable pedagogical values or principles (e.g., 'inclusive' or 'democratic' technologies) (Postman 1993; Hamilton and Friesen 2013), and instrumentalism, where technologies are neutral tools that people can use to achieve their aims (Kaplan 2009).

From a postdigital view, technologies do not act independently, nor are they simply tools under the control of people. Instead, they work through situated entanglements with purposes, values, contexts, and teaching methods (Fawns 2022). For example, the ways in which educational designs or uses of technology play out are influenced by personal and institutional conditions, infrastructures, politics, culture, environment, and so on. Postdigital education emphasises the critical examination of complex relationships between humans, technology, and the broader social context (Jandrić et al. 2018).

As such, a postdigital perspective on education can help to guard against sweeping, often discriminatory, claims. For example, from a postdigital perspective, it is not appropriate to divide people into 'digital natives' or 'digital immigrants' (a distinction based on when you were born that determines how capable you can be with digital technology) (Prensky 2001), because of differences in access, infrastructure, interest, support networks, forms of technical and critical knowledge, and more (Bayne and Ross 2007; Helsper and Eynon 2010). It problematises claims that online students are less engaged than on campus students, or that 'online learning' is inferior to 'on campus education' (Fawns et al. 2019), since engagement, outcomes and experiences are contingent on a complex combination of variables including infrastructure, design, the expertise and attitudes of educators and students, and so on (Fawns 2019). Distinctions between modalities (e.g., online, on campus, hybrid) are not clear-cut: video-based meetings might be considered 'face-to-face', students often engage in online activities while 'in-person' or 'on campus', and so on (Fawns et al. 2019). Nor can online courses be mere versions of face-to-face courses (Sinclair and Macleod 2015) because technology shapes possibilities for design and practices.

Importantly, postdigital education is concerned with producing alternative narratives to the neoliberal ideals of accountability, efficiency, transparency, or technological determinism that have come to dominate educational policy, strategy, research, and discourse, and that can have harmful, marginalising effects on vulnerable people (Jandrić and Knox 2022; Knox 2019). Through its resistance to narrow, reductive or instrumental views of the relationship between technology and education, postdigital education advocates for social and environmental justice, equity, and emancipation, and an ethic of care towards the oppressed and deprivileged (Jandrić and McLaren 2020). Focusing on diverse and situated educational activity, and the conditions in which it emerges, supports educators to navigate the educational possibilities of technology while also bringing attention to issues of ethics, social justice, and environmental impact. This then highlights a need for the development of educators, students, and others, beyond technical knowledge, to critical thinking and a broader and more socially responsible understanding of educational practices (Fawns 2022).

Social Justice

Postdigital education is built on principles of critical theory (Freire 1972) that emphasise the agency and social responsibility of learners, educators, and other educational stakeholders. It is aimed at creating an alternative to an increasingly pervasive consumerist view of education, supported by free-market and managerialist principles of neoliberalism (Olssen and Peters 2005; Naidoo and Williams 2015) and what Hayes (2017) calls the 'McDonaldisation' of education. In this culture, students and educational practices are 'homogenised' or seen as fitting into a predetermined model and educational quality and outcomes are seen as something that can be guaranteed. This has resulted in increasing monitoring and surveillance (Fawns and Schaepkens 2022; Gourlay 2022), the prioritisation of accountability over trust in educators, institutions, and students (Fawns et al. 2021; Fawns and Sinclair 2021), and the marginalisation of inclusivity or diversity (Hayes 2019). Consumerism and neoliberalism make education more susceptible to datafication and data-driven practices (Knox et al. 2020), including those of teachers (Arantes and Buchanan 2022). This can result in a form of oppression where the economically-driven interests of stakeholders are privileged over the needs of students or educators (Fawns and Sinclair 2021).

Postdigital education opposes the marginalisation of learners who find it difficult to conform to educational norms or expectations (Reed 2022). It also seeks to expose and critique 'the increasing entanglement of digital technology in capitalism and capitalist society' (Knox 2019: 368). For example, an increasing share of control over educational processes is being given to commercial companies, resulting in tensions between commercial and public education values (Andrejevic and Selwyn 2023). This political-economic landscape also supports the positioning of machines and algorithms as more 'objective' than human teachers in relation to decision-making and judgement (including grading) (Selwyn et al. 2023).

However, while technology can make things easier to some people in some circumstances (e.g., by offering remote education to those who cannot physically travel to a classroom), it can also make it more difficult in other ways (e.g., where people do not have access to the necessary devices, infrastructure, or knowledge) (Czerniewicz and Carvalho 2022). A 'digital divide' has opened up (van Dijk 2020), reflecting differences in technology access, skills, knowledge and agency, including differences across global areas (Czerniewicz and Carvalho 2022). Beyond a simple 'divide', however, there are many forms of digital advantage and disadvantage, including differences in ability to resist the collection of data about oneself and the security and privacy of that data (Hayes et al. 2022).

A postdigital view raises important ethical questions around digital and data-driven educational practices, student privacy concerns, power dynamics, political-economic agendas, and tensions with principles of diversity, equity, and inclusion (Jandrić et al. 2018). For example, genetic predictions regarding educational, socioeconomic, and life outcomes carry significant social and ethical implications that can be associated with eugenics as a tool of oppression (Wheeler 2017). The growing authority of data science experts over educational procurement (the purchasing of educational technology) and methods is of concern to those with a postdigital view of education, since these experts are increasingly able to shape educational funding, including corporate investments, and the ways that students are positioned in policy and discourse (see, e.g., Peters et al. 2023).

Data driven practices, in combination with surveillance and monitoring, can foster performativity, where students are encouraged or required to behave in accordance with the rules of a system (Olssen and Peters 2005). 'Personalised learning', for example, can be seen as a kind of data-driven behaviourism, where learners are given customised instructions or 'nudged' according to associations between patterns in their user data patterns and the outcomes achieved by learners with similar patterns (Knox et al. 2020). The outcomes that are used as behavioural targets are often described via inequitable forms of assessment and measurement (Farag et al. 2022) and, in the name of optimising

engagement and outcomes, data-driven processes often lead to standardisation, thereby sacrificing equity and social justice for economic efficiency (Fawns et al. 2021). In this environment, the concept of student engagement may become narrowly defined to emphasise easily-measured activities at the expense of others (Gourlay 2015) and the role of the teacher may be marginalised. An overemphasis on teaching metrics, combined with the automation of everyday educational practices through technology, can reduce teachers to technicians (Selwyn et al. 2023).

In response, a postdigital perspective highlights the importance of transdisciplinary conversations for surfacing and critiquing principles, ethics, and implications of the ways that digital technologies are integrated into education (Peters et al. 2023). Social justice is an important principle for many scholars of postdigital education. It involves questioning who benefits or suffers from different implementations of digital technology and examining the effects on local or global environments (Misiaszek 2020), differences in students' technological access and home infrastructures, what happens with students' data, and the place of technology in community-building (Bali and Zamora 2022). Aspects of education that are not clearly represented within data held by technological platforms risk being neglected or discriminated against. Datasets tend to be biased towards white, male, Western and historically privileged people, and algorithms often amplify that bias in subtle and unsubtle ways (Selwyn et al. 2023). Examples of bias include automated racism in search engine results (Noble 2018), profiles with only male or female gender fields, the inability of online exam proctoring systems to register faces of Black students (Selwyn 2022), and many more.

Environmental Justice and Ecopedagogies

An example of postdigital education that focuses on consideration of environmental harms through technology is the emergence of ecopedagogies. Drawing on the work of Freire (1972), Illich (1983), and others, ecopedagogies recognise and address social and environmental implications of the ways in which technology is embedded in education (Jandrić and Ford 2022). Ecopedagogies encourage teachers and students to consider the broader impact of digital technologies on the environment and potential inequalities that may arise in different, sometimes hidden, ways (Knox 2019; Czerniewicz and Carvalho 2022).

While the discourse around digital education, reinforced by metaphors of 'the cloud' or 'cyberspace', can convey disembodiment or the absence of physical materials, computing devices are made from rare minerals, and server centres and data farms consume vast amounts of energy, particularly those that support artificial intelligence and machine learning (Selwyn 2021). As Selwyn notes, there are important questions of whether trends of increasing digital technology use in general, and high bandwidth technologies such as video and big data processing in particular, are sustainable.

Trends of expanding consumption through digital technology are at odds with concerns about climate change, labour conditions (e.g., cobalt mining or training and moderating AI platforms) and economic monopolisation. Postdigital education has a role to play in critiquing trends in education to keep sight of such issues. Ecopedagogies are designed to foster critical awareness of environmental harms and provide positive ways forward by helping educators and students to reimagine, co-create, and take action (Jandrić and Ford 2022). For example, ecopedagogies can support alternative narratives through the integration of non-Western and indigenous forms of knowledge (Misiaszek et al. 2022). Yet, a postdigital sensibility also acknowledges that technology has a role to play in addressing problems that have been shaped by technology (Selwyn 2021), for example through providing an infrastructure for collective action against resist harms (Networked Learning Editorial Collective 2021).

Datafication

Increasingly, education involves quantifying student behaviour or biological information (including genetics, emotions, and brain activity), teaching interventions, subjective judgements, administrative processes, and more, and then tracking and analysing these data points to predict outcomes and inform educational interventions and policy (Gourlay 2022; Williamson 2017). Learning analytics platforms are an example of an educational technology that captures learner and teacher interactions and generates representations of behavioural patterns and trajectories. This is aimed at predicting and optimising educational processes through behavioural nudges and the identification of 'at risk' students (Luan and Tsai 2023). Digital traces of learner and teacher interactions are used to generate behavioural patterns that inform predictions about risk and success. These may then be used to 'optimise' and 'personalise' learner activity through behavioural 'nudges' in the form of pacing, instructions, tasks, and resources. This is a form of datafication: the conversion of analog elements into digital information and then operating on that data as if it is equivalent to the original source (Fawns et al. 2021).

New fields of educational data science and bioinformatics represent another related trend in the datafication of human activity in education (primarily within schools but also, increasingly, tertiary education) (Williamson 2020). The 'precision education' movement, for example, combines increasing computing power, big data approaches, and machine learning with biological, psychological, and neurological sciences to analyse, predict, and shape learning processes (Williamson 2016). This movement aims to make use of biological and physical information captured through wearable health-tracking devices, psychological and emotional information obtained using sensory devices, and neurocomputational devices that monitor patterns of brain activity. As Williamson notes, in the field of social genomics, identifying genetic variations and traits that influence students' learning abilities is thought to enable early identification of learning challenges, allow targeted support, and inform personalised learning strategies aimed at enhancing engagement, performance, and overall success.

In postdigital education, the details of how technology is integrated into educational situations matter (Fawns 2019). This means considering alternative forms of evidence beyond simple causal inference (introducing a particular technology will result in a particular outcome) and beyond trying to identify 'what works' (Biesta 2010; Fawns 2022). Postdigital perspectives see learning situations as complex combinations of different kinds of relations and activity (Goodyear and Carvalho 2019) and seek to avoid the bias, present in much research into education and technology, towards positive evaluations and excessive optimism by proponents of technologies and 'technology-enhanced learning' methods Henderson et al. 2017), by also considering actual and potential harms (Fawns and Sinclair 2021). A postdigital view rejects the idea that education is a problem that can be solved, particularly through the introduction of technology, and helps us question assumptions that technology-led approaches, such as those based on artificial intelligence and machine learning, can independently, positively transform education (e.g., Ouyang et al. 2022).

Labour and Expertise

Postdigital views critique the datafication of educational practices as leading to narrow, instrumental understandings of education (Fawns et al. 2021) that ignore the context and the messiness in which the data were generated (Macgilchrist 2021). While data-driven technologies offer opportunities for productive dialogue, they also carry risks. Personalised learning systems and learning analytics, for example, can impede learners from directing the personalisation of their learning practices, favouring profiling or diagnosis over discussion, collaboration, personal exploration, or the development of adaptive or self-regulating approaches to learning (Fawns

2019; Fawns et al. 2021). Overemphasising digital traces of learner behaviour also neglects the social and material context in which learning occurs, resulting in an incomplete and distorted view (Gourlay 2022). Additionally, it reinforces certain theoretical positions at the expense of others, such as the notion that learning is an individual rather than social or collaborative endeavour (Fawns et al. 2021).

By framing patterns of biological data and machine learning as central to educational approaches and outcomes, ideas like precision education, social genomics, or data-driven systems focused on prediction and instruction, can hide human labour and expertise, as well as the importance of learning relationships and experiences (Ouyang et al. 2022). Postdigital education recognises that human labour and relationships are important aspects of education, and resists language that implies that educational work is done by strategies, methods, innovations or technological platforms (Aitken and Hayes 2021).

Postdigital education recognises that technology is important but sees it as part of a complex combination of elements. The effort and expertise that goes into educational activity is shared across different people (educators, students, and others) as well as technologies and environments (Fawns 2022; Markauskaite et al. 2023). Educational outcomes result from the somewhat unpredictable combinations of digital and analog elements (Fawns 2019; Gourlay 2021). The conditions in which people study also shape which technologies they can access and what their interactions with those technologies will be like. This complexity means that there are no simple cause-and-effect relationships between educational approaches and student outcomes, and teachers need more than digital skills to successfully engage with technology: they also need an awareness of how to integrate technology into their range of educational practices such that it is sustainable for themselves, their students, and the environment (Markauskaite et al. 2023).

The concept of 'agency', how much control or power one has over one's actions, decisions, and circumstance, is very important to postdigital views of education (Jandrić et al. 2018; Reader 2023). From a postdigital perspective, the agency of people is always shared and negotiated. In other words, educators and students cannot act independently of other people, systems, infrastructures, or the environment. The related field of posthumanism has informed postdigital education through its refusal to separate individuals from their environment (Thomas 2021: 202). In contrast to transhumanism (the enhancement of human individuals through technology such that they transcend their human condition), a posthuman perspective sees humans as entangled parts of bigger 'assemblages' of multiple people, technologies and material objects, all acting together (Knox 2016; Sinclair and Hayes 2019). These assemblages are also partly shaped by bigger political and economic forces such as governments and technology companies (Bayne and Jandrić 2017).

This view challenges traditional, often linear ideas of technological progress, but also of what it means to be human and how we define ourselves as individuals. For example, posthumanism challenges the belief that humans are superior and independent beings, arguing that this notion has been shaped by oppressive and discriminatory systems (Thomas 2021). Advocates of postdigital education may or may not hold a posthumanist view of the world (Fawns et al. 2023), but they share an emphasis on critically questioning the workings of systems in relation to autonomy, agency and social justice.

Postdigital Research in Education

A range of research approaches can be called 'postdigital', particularly those that follow a posthuman or sociomaterial conception of digital technology. According to Fawns et al. (2023: 86), 'whether or not a project can or should be labelled as postdigital is less important than whether it contributes to our understanding of technology as embedded in complexity' (see also Selwyn 2023). However, there is currently limited research that explicitly takes up an explicitly postdigital perspective from the outset, and the emergence of postdigital thought has manifested

primarily through discourse and scholarship rather than research.

Two books in the *Postdigitial Science and Education* series (Jandrić et al. 2023a, b) were published with the aim of beginning to address this gap. These books did not seek to establish a clear blueprint for postdigital research. However, alongside providing examples of postdigital critique of dominant forms of research into education and technology (e.g., Williamson 2023), they suggested some parameters for an explicitly postdigital approach to inquiry. For instance, postdigital research must find a way to define the boundaries of complex areas of inquiry (e.g., entanglements of political, economic, and ethical implications), while preserving a clear sense of focus around what the researchers care about (Mörtsell and Gunnarsson 2023). The advancement of a social justice agenda, and the emancipation of disadvantaged and vulnerable people from forms of oppression, is a crucial component of most postdigital education research (Jopling 2023: 165).

Fawns et al. (2023) proposed that an essential ingredient of explicitly postdigital research is an *on-yet-around focus*, where researchers navigate a tension between focusing on uses and effects of a technology and on how it is connected with other elements of a social system or ecosystem. They also proposed valuable but non-essential ingredients for postdigital research aimed at breaking down the separation of technology from social, political, economic and other contexts. The first was including diverse voices and perspectives in order to open up new ideas and possibilities for postdigital research. The second was transdisciplinarity, where different disciplines not only work together but combine different methodologies to make new research approaches (Jandrić and Knox 2022). The third was the inclusion of creative, speculative, or compositional methods, where approaches to research are newly created according to the problem or area being investigated, rather than using pre-existing methods (Lury 2021).

While postdigital research often involves creating new approaches, this does not mean that any approach is appropriate. Each method should be judged according to its potential for engaging with the problem it is designed to address (Ross 2023). Because of postdigital education's recognition of the entanglement of people and technology, researchers of this field should engage in reflexive consideration of their positionality (the ways in which they, and their beliefs, are connected to what they are researching) as well as the positionalities of others (Hayes 2021; Palitt and Kramm 2023).

Summary

Postdigital education offers a critical lens through which to understand the complex nature of educational practices in contemporary contexts. By acknowledging the interplay between digital, social, and material elements, it challenges the dichotomy of analogue and digital education and promotes a more comprehensive and socially accountable understanding of technology's role in education. Through this, postdigital education allows for a nuanced understanding of the complex relationships between a range of factors, including political, economic, environmental, and biological. Such a view also involves challenging assumptions and generalisations, not only about particular technologies but also datafied and data-driven educational practices. Doing so is important for generating understandings of the role of technology in education that can support the ongoing pursuit of ethical and socially just practices.

Cross-References

- ▶ Networked Learning
- ▶ Postdigital
- ▶ Postdigital AI and Education
- ▶ Postdigital Collective Intelligence
- ▶ Postdigital Connectivism
- ▶ Postdigital Critical Media Literacy
- ▶ Postdigital Critical Pedagogy
- ▶ Postdigital Curriculum
- ▶ Postdigital Ecopedagogies
- ▶ Postdigital Educational Futures

- Postdigital Equality of Opportunity
- Postdigital Freirean Ecopedagogy
- Postdigital Identity
- Postdigital Intellectual
- Postdigital Intercreative Pedagogies
- Postdigital Knowledge Ecologies
- Postdigital Learning Design
- Postdigital Learning Spaces
- Postdigital Research
- Postdigital Schooling
- Postdigital Science Education
- Postdigital University

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