

Developing a richer critical stance in developing D&T Teachers: Critiquing Disruptive Technologies from a Maker and Luddite stance

Lightning Talk Short Paper

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Abstract

The idea of Disruptive Technologies can be a useful lens through which to identify technologies that are likely to have a significant impact. However, in the light of the rapid development of some of these technologies and their potential implications for humanity, we need to develop tools to help students (both ITE and school) develop an appropriately critical stance. I suggest the use of Sadowski's (2025) framing of the 'mechanic' and 'luddite' to help structure such a stance.

Keywords: (Disruptive, Technology, Capitalism, Mechanic, Maker, Luddite)

AIMS OF D&T

One way of articulating these aims is to say that they are to foster both technological capability and technological perspective (Barlex et al, 2017). Here technological capability is defined as 'designer-maker capability', capturing the essence of technological activity as intervention in the made and natural worlds. Whereas technological perspective provides insight into "how technology works" to inform a constructively critical view of technology, thus avoiding alienation from our technologically based society and enabling consideration of how technology might be used to provide products and systems that help create the sort of society in which pupils wish to live.

Four kinds of curriculum 'brick' have been suggested and seem widely agreed on as the fundamental elements of a D&T curriculum (Barlex et al, 2017): Designing and making (D&M), mainly designing (MD), mainly making (MM) and Exploring Technology (ET). Figure 1 indicates how these can combine to support the development of both kinds of capability.

DISRUPTIVE TECHNOLOGIES

Barlex, Givens and Steeg have suggested in various publications (Barlex et al, 2022) that one way of focussing on ET is to explore so-called disruptive technologies; at the time we were first writing we identified nine such technologies: Additive manufacturing, Artificial intelligence, Augmented Reality, Big Data, Programmable matter, Internet of Things, Neurotechnology, Robotics and Synthetic Biology.

Since we first started talking about these some have remained mere glints in the eyes of technologists, while others have grown significantly in their impacts, both actual and potential, on society. In two cases, namely AI and big data (which are recognised as being intimately coupled), the threat to human (and humane) society have become widely recognised. The potential of any, or all, of

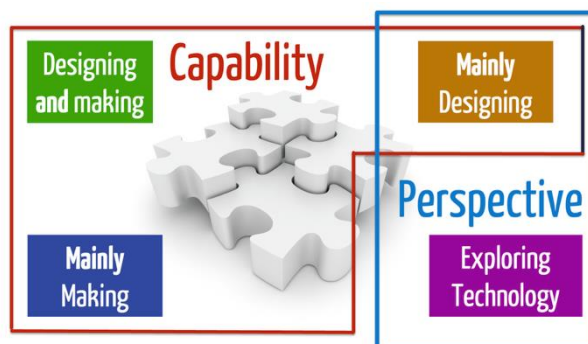


Figure 1. D&T Curriculum building blocks

neurotechnology, robotics or synthetic biology to also threaten us, while less discussed, is heightened by their own links to AI and big data.

DEVELOPING A CRITICAL STANCE

In the light of these threats, 1) what role might, or should D&T education have in developing critical understanding in school age students? 2) Are there critical lenses we can use to help us as a subject community get to grips with such a complex area? 3) What tools can we develop to help D&T teachers work in this area?

To take these questions briefly: Firstly, I think D&T should have a part to play, perhaps a central role, in developing such understanding. This seems to me to link to the idea of values in D&T (Martin, 2022), which is no longer writ as large in D&T curriculum documents as it once was – but should be revived. In relation to the third question, this is something I'm going to duck for now, but that we really need to not lose sight of; especially as we note that despite the four D&T activities being widely accepted as a structure to inform curriculum design in D&T, anecdotal evidence, including from PGCE students, suggests that ET, in particular, is rarely a feature of SoWs. (And, tangentially, this also links to the need to think much more deeply about how a D&T curriculum should respond to the threats and lived reality of climate heating.)

TECHNOLOGY AND CAPITALISM

The rest of this paper outlines a possible way of responding to the second question. It has been prompted by Sadowski (2025), who argues that Technology and Capitalism exist as systems that are treated as 'beyond' humans even though they are human systems. They are viewed as being out of control of even the most powerful and influential; in relation to technology, we can see this in the widely used framing of 'Technological Determinism' to explain how technologies are developing; see for example Altman (2024), Kelly (2010). (A more useful way of framing the development of technology is seeing as it having 'momentum' (Hughes 1994), this leaves open the idea that intervention to change direction is possible. As far as capitalism goes, even mainstream left-leaning political parties seem to have accepted that a capitalist world view is inevitable.

MAKERS AND LUDDITES

Sadowski's core thesis is that if we are to challenge the hegemonies of technology and capitalism, we need to adopt two complementary and 'materialist' stances: those of the mechanic and of the Luddite. By mechanic he means someone who "knows how a machine is put together, how its parts function, and what work it does.", he exemplifies what he means by talking about the kind of people who tinker, make things, adapt things, who, broadly, see the made world as something they can and should understand and be able to interact with – who are not disenfranchised by technology. I have chosen, to replace his term 'mechanic' with 'maker' as I think that more clearly summarises, for our largely educational audience, the spirit we are looking for.

In discussing luddites he is clear that he is using an historically informed view of the purposes of Luddism (as opposed to the current common playground-style insult to mean being mindlessly anti-technology); "The Luddite knows why the machine was built, whose purposes it serves, and when it should be seized—in both senses of stopped or taken, destroyed or expropriated."

Sadowski's insight is that neither the maker nor luddite stance alone is sufficient, "The materialist analysis of the mechanic provides the basis for the material action of the Luddite."

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