

Children and Young People: Digital Technology

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Baroness Greenfield (CB)

I thank the noble Baroness, Lady Kidron, for the opportunity to speak in this timely debate. Having been a tutor in neuroscience at Oxford, and as CEO of a biotech company, Neuro-Bio, I shall focus on how digital technology influences brain function.

Humans occupy more ecological niches than any other species on the planet because of our superlative ability, compared with any other animal, to adapt to the environment. Our brains become highly personalised through the development of unique configurations of connections between our brain cells that characterise the growth of the human brain after birth, personalising it into a highly individual “mind” that is in constant dialogue with, and continuously updated by, the environment.

Digital technology opens up an unprecedented environment. Now, for the first time, you can live effectively in a parallel universe: recreation via video games, friendship via social media and learning via search engines. Let us take each one in turn. The World Health Organization and the American Academy of Pediatrics have both recently characterised addictive internet gaming as a psychiatric disorder. The neuronal mechanism of addiction is an enhanced release of the chemical messenger dopamine, which underlies the anticipation of reward, raised arousal levels and the neuronal mechanisms of drug addiction.

We know that dopamine inhibits the prefrontal cortex, a part of the brain that is particularly dominant in humans. This region becomes fully operational only in late-teenage years; until then, there is a well-recognised characteristic profile of recklessness, short attention span and—most significantly—overdependency on external stimulation. An immature prefrontal cortex, coupled with surges of dopamine during video gaming, could result in a mindset driven to have, literally, a “sensational time”.

What of social media? When you meet someone face to face, only 10% of the total impact is dependent on language; much more relies on the tone and volume of your voice, eye contact,

body language and of course physical touch, none of which is available via a screen. If we do not rehearse these skills, we will not be very good at them. Face-to-face interaction will be ever more aversive, resulting in impaired interpersonal skills, increasingly referred to nowadays as “virtual autism”.

What of learning? Two secondary school teachers in Washington DC, Joe Clement and Matt Miles, recently published *Screen Schooled*, a book that persuasively sets out the evidence and arguments that too much screen time has resulted in students who lack focus and critical-thinking skills—and we should remember that information from the screen is not the same as knowledge. The profile of the mid-21st century mindset could comprise: a short attention span, addictive, reckless, low on empathy, and with a fragile sense of identity and poor critical thought.

A key factor is an overemphasis on the sensory pull of the immediate moment, oblivious to any relationship to the past or future. Yet it is just such a linear sequence of a merging of past, present and future—more generally, a beginning, a middle and an end—that characterises the thought process itself, leading to language, sentences, stories, life stories and hence a robust individual identity. Surely we need to promote behaviours that, instead of multitasking, mandate sequencing single actions in a specific order over an extended timeframe—cooking or gardening, for example. Perhaps the most obvious form of sequencing would be reading, ideally from a real book.

Sport is another activity that precludes multitasking. Moreover, physical exercise results in the production of new brain cells, enhanced academic performance and a reduction in mental impairments, not to mention the benefits against obesity.

In 1964, the writer Isaac Asimov predicted life 50 years on. He said: “The lucky few who can be involved in creative work of any sort will be the true elite of mankind, for they alone will do more than serve a machine”.

It is ironic that excessive use of digital technology may well be eroding the very talents we will need to compete with AI in the workplace of the future. To thrive in our current culture, we need to refocus our priority on nurturing self-confident and thoughtful individuals for whom digital devices do not drive the agenda of their daily life but are merely part of a more diverse toolkit for attaining personal fulfilment in the real world.