'Stumbling into a Powerful Technology'

Baroness Greenfield on New Media and Young Minds

Susan Adele Greenfield, an accomplished neuroscientist, Oxford professor, business entrepreneur, and science popularizer, has been the director of the Royal Institution of Great Britain since 1998 and a member of the House of Lords since 2001. On April 20, 2006, she rose to discuss the effects of television, computers, and drugs on children's education. Her comments, excerpted from the Lords Hansard, appear below.

My Lords, the twenty-first century is offering society an unprecedented raft of challenges. All at once science is now delivering a diverse range of information technology, nanotechnology, and biotechnology, with a speed and convergence that we could never have predicted even a decade ago.

For example, one recent survey of eight to eighteen-year-olds claimed that children were now spending on average 6.5 hours a day using electronic media. Most recently, the trend to multi-tasking—that is, using one or more devices in parallel—amounted to an effective 8.5 hours a day. Could this screen and multimedia culture impact on thinking and learning? The journalist Kevin Kelly [the founding editor of *Wired*] summed up the issue very well: "Screen culture is a world of constant flux, of endless sound bites, quick cuts and half-baked ideas. It is a flow of gossip tidbits, news headlines and floating first impressions. Notions don't stand alone but are massively interlinked to everything else; truth is

not delivered by authors and authorities but is assembled by the audience."

When we of the twentieth century read a book, most usually the author takes you by the hand and you travel from the beginning to the middle to the end in a continuous narrative series of interconnected steps. It may not be a journey with which you agree or that you enjoy, but nonetheless as you turn the pages one train of thought succeeds the last in a logical fashion.

We can then of course compare one narrative with another. In so doing we start to build up a conceptual framework that enables us to evaluate further journeys, which in turn will influence our individualized framework. One might argue that this is the basis of education—education as we know it. It is the building up of a personalized conceptual framework, where we can relate incoming information to what we know already. We can place an isolated fact in a context that gives it significance. Traditional education has enabled us, if you like, to turn information into knowledge.

Now imagine that there is no robust conceptual framework. Imagine that you are sitting in front of a multimedia presentation where you are unable, because you have not had the experience of many different intellectual journeys, to evaluate what is flashing up on the screen. The most immediate reaction instead would be to place a premium on the most obvious feature, the immediate sensory content—we could call it the "yuk" or "wow" factor. You would be having an experience rather than

learning. Here sounds and sights of a fast-paced, fast-moving, multimedia presentation would displace any time for reflection or any idiosyncratic or imaginative connections that we might make as we turn the pages and then stare at the wall to reflect.

Navigation on the Internet is wonderful if you have a conceptual framework in which to embed the responses that flash up. We should not assume that all children nowadays will be so well equipped....We now have access to unlimited and up-to-date information at the touch of a button, but in this new, answer-rich world surely we must ensure that we are able to pose appropriate, meaningful questions.

Does this mean that young people are acquiring different skills? According to the National Literacy Trust, whom I would like to thank for their help, there is currently no conclusive evidence that reading standards are deteriorating. On the other hand, there is evidence that the enjoyment of reading has declined in the last five to ten years. Also, children perhaps have more interests competing for their time. They may be spending a lot less time just playing or doing nothing. Of course, "doing nothing" would presumably include thinking and letting your imagination roam free.

The Literacy Trust pointed out that reading from the screen was just as legitimate as reading from a book, but we might ask how long this trend will continue. Already the visual icon is often substituting for the written word. Soon the spoken word will be increas-

ingly available. If we soon have voice-interface computers—such computers are in the near future—embedded in our clothing or personal effects, you might simply need to ask your watch for the date of the Battle of Hastings.

Memory, for example, may no longer be as essential as it was for those of us who had to remember such dates or had to learn reams of Latin grammar. Along with the ability to read and the need to remember, surely we are at risk of losing our imagination, that mysterious and special cognitive achievement that until now has always made the book so very much better than the film....

We need a meta-analysis that is nationwide, one of shifting trends in the whole portfolio of learning and thinking skills. I am sure that many parents and grandparents would welcome hard statistics on critical factors such as hours spent in front of a screen, critical age ranges, mitigating influences of other activities, and above all what abilities such as creativity may now be lost and what may now be gained with this new way of processing information compared to those of us educated in the last century. Perhaps the increase in prevalence of hyperactivity might be explained by sustained exposure to an unsupervised IT [information technology] environment where only short attention spans were ever needed and where the child had no way of practicing long periods of paying attention. That is a speculative idea but one that I think should at least be tested.

I am not proposing that we become IT Luddites but rather that we could be stumbling into a powerful technology, the impact of which we understand poorly at the moment. The new technologies are also convergent, embracing not only screen culture but drug culture. A recent excellent summary has been published by [the center-left British think tank] Demos entitled *Better Humans?*, which surveys the issue of performance enhancement by...[various means] such as, most immediately, drugs. Already there were reports last weekend of an alarming increase in the use of Prozac, a mood enhancer. Ritalin, for enhancing concentration, and Provigil, for extending alert wakefulness, are also drugs that are currently medicating the classroom. The problem with these drugs is that they do not target a single trait such as mood or concentration or wakefulness, not least because we do not yet understand as neuroscientists how such functions are generated as a cohesive operation in the brain: rather, drugs will manipulate, in a very broad spectrum way, the chemicals—the so-called transmitters—in the brain that, in turn, could have both widespread and also long-lasting effects....

The human brain is exquisitely sensitive to any and every event: we cannot complacently take it as an article of faith that it will remain inviolate, and that consequently human nature and ways of learning and thinking will remain constant. A new idea is that there is room for improvement: so-called "transhumanism"—described

by Professor Fukuyama, a professor of international politics, as "the world's most dangerous idea"—promotes the ability of science and technology to go beyond the authority and the norm—whatever that is—for physical and mental human enhancement. The idea of enhancement is sinister in whatever way it would be applied. If, in the unlikely event that everyone could be improved to the same extent, we would end up in a monotonously homogenous world predicated on the assumption that each of us was naturally inadequate. Worse still, and more likely, would be the scenario where only a minority were so "favored"—a sector of society of techno "haves" increasingly divergent from the techno "have-nots."

We must surely choose to adopt technology that will ensure that the classroom will fit the child, and buck the growing trend for technology to be used to make the twenty-first-century child fit the classroom. The educational needs of the individual are changing and the very nature of the classroom needs to change too....

Many admirable projects are in train but the public need to know about them, and they need to know about each other. One such, our own Institute for the Future of the Mind at the James Martin School in Oxford, is asking four questions. What are the influences on children today? Where is the actual evidence of a new type of impact? What do children need to learn? And, most importantly, how do we deliver these desiderata? No one independent institution or organization, and no one single project, can take on such a challenge. We turn to Her Majesty's Government to spearhead a large-scale public debate, thereby ensuring that British citizens of the mid-twenty-first century have the most fulfilling lives possible, in the most successful society possible.