Critical Thinking

Society has long cherished the ability to think beyond the ordinary, and in a world where knowledge is revered and innovation equals progress, those able to bring forth greater insight and understanding are destined to make their mark.

'Critical thinking as an attitude is embedded in Western culture. There is a belief that argument is the way to finding truth,' observes Adrian West, research director at the Edward de Bono Foundation U.K., and a former computer science lecturer at the University of Manchester.

Although there's little debate that information technology complements – and often enhances – the human mind in the quest to retain information and process an ever-growing tangle of bits and bytes, there's increasing concern that the same technology is changing the way we approach complex problems and conundrums, and making it more difficult to really *think*. 'We're exposed to greater amounts of poor yet charismatic thinking, the fads of intellectual fashion, opinion, and mere assertion,' says West. 'The wealth of communications and information can easily overwhelm our reasoning abilities.' What's more, it's ironic that ever-growing piles of data and information do not equate to greater knowledge and better decision-making. What's remarkable, West says, is just 'how little this has affected the quality of our thinking.'

According to the National Endowment for the Arts, literary reading has declined 10 percentage points, and the rate of decline is accelerating. Many, including Patricia Greenfield, a UCLA distinguished professor of psychology and director of the Children's Digital Media Center, Los Angeles, believe that a greater focus on visual media exacts a toll. 'A drop-off in reading has possibly contributed to a decline in critical thinking,' she says. 'There is a greater emphasis on real-time media and multitasking rather than focusing on a single thing.' Nevertheless, the verdict isn't in and a definitive answer about how technology affects critical thinking is not yet available. Instead, critical thinking lands in a mushy swamp somewhere between perception and reality; measurable and incomprehensible.

Arriving at a clear definition for critical thinking is tricky. One source describes it as 'purposeful and reflective judgment about what to believe or what to do in response to observations, experience, verbal or written expressions, or arguments.' Overlay technology and that's where things get complex. 'We can do the same critical-reasoning operations without technology as we can with it – just at different speeds,' West says.

Moreover, while it's tempting to view computers, video games, and the internet in a largely good or bad way, the reality is that they may be both, and different technologies, systems, and uses yield entirely different results. For example, a computer game may promote critical thinking or detract from it. Reading on the internet may ratchet up one's ability to analyze while chasing an endless array of hyperlinks may undercut deeper thought.

Exposure to technology fundamentally changes the way people think, says Greenfield, who recently analyzed more than 50 studies on learning and technology, including research on multitasking and the use of computers, the internet, and video games. As visual media have exploded, noticeable changes have resulted, she notes. 'Reading enhances thinking and engages the imagination in a way that visual media such as video games and television do not,' Greenfield explains. 'It develops imagination, induction, reflection, and critical thinking, as well as vocabulary.' However, she has found that visual media actually improve some types of information processing. Unfortunately, 'most visual media are real-time media that do not allow time for reflection, analysis, or imagination,' she says. The upshot? Many people – particularly those who are younger – wind up not realizing their intellectual potential.

How society views technology has a great deal to do with how it forms perceptions about critical thinking. And nowhere is the conflict more apparent than at the intersection of video games and cognition. James Paul Gee, a professor of educational psychology and author of *What Video Games Have to Teach Us About Learning and Literacy*, points out that things aren't always as they appear. 'There is a strong undercurrent of opinion that video games aren't healthy for kids,' he says. 'The reality is that they are not only a major form of entertainment, they often provide a very good tool for learning.' In fact, an expanding body of evidence indicates that joysticks can go a long way toward helping children gain better reasoning skills. Games such as *Sim City* and *Civilization* extend beyond rote memorization, and teach decision-making and analytical skills in immersive, virtual environments that resemble the real world, Gee says. Moreover, these games – and some virtual worlds – give participants freedom to explore ideas and concepts that might otherwise be inaccessible or off limits.

It's certain that in the digital age, critical thinking is a topic that's garnering greater attention. As reading and math scores decline on standardized tests, many observers argue that it's time to take a closer look at technology and understand the subtleties of how it affects thinking and analysis.

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