Skim reading is the new normal. The effect on society is profound

Maryanne Wolf

When the reading brain skims texts, we don't have time to grasp complexity, to understand another's feelings or to perceive beauty. We need a new literacy for the digital age

Look around on your next plane trip. The iPad is the new pacifier for babies and toddlers. Younger school-aged children read stories on smartphones; older boys don't read at all, but hunch over video games. Parents and other passengers read on Kindles or skim a flotilla of email and news feeds. Unbeknownst to most of us, an invisible, game-changing transformation links everyone in this picture: the neuronal circuit that underlies the brain's ability to read is subtly, rapidly changing - a change with implications for everyone from the pre-reading toddler to the expert adult.

As work in neurosciences indicates, the acquisition of literacy necessitated a new circuit in our species' brain more than 6,000 years ago. That circuit evolved from a very simple mechanism for decoding basic information, like the number of goats in one's herd, to the present, highly elaborated reading brain. My research depicts how the present reading brain enables the development of some of our most important intellectual and affective processes: internalized knowledge, analogical reasoning, and inference; perspective-taking and empathy; critical analysis and the generation of insight. Research surfacing in many parts of the world now cautions that each of these essential "deep reading" processes may be under threat as we move into digital-based modes of reading.

This is not a simple, binary issue of print vs digital reading and technological innovation. As MIT scholar Sherry Turkle has written, we do not err as a society when we innovate, but when we ignore what we disrupt or diminish while innovating. In this hinge moment between print and digital cultures, society needs to confront what is diminishing in the expert reading circuit, what our children and older students are not developing, and what we can do about it.

We know from research that the reading circuit is not given to human beings through a genetic blueprint like vision or language; it needs an environment to develop. Further, it will adapt to that environment's requirements – from different writing systems to the characteristics of whatever medium is used. If the dominant medium advantages processes that are fast, multi-task oriented and well-suited for large volumes of information, like the current digital medium, so will the reading circuit. As UCLA psychologist Patricia Greenfield writes, the result is that less attention and time will be allocated to slower, time-demanding deep reading processes, like inference, critical analysis and empathy, all of which are indispensable to learning at any age.

The negative effects of screen reading can appear as early as fourth and fifth grade

Increasing reports from educators and from researchers in psychology and the humanities bear this out. English literature scholar and teacher Mark Edmundson describes how many college students actively avoid the classic literature of the 19th and 20th centuries because they no longer have the patience to read longer, denser, more difficult texts. We should be less concerned with students' "cognitive impatience," however, than by what may underlie it: the potential inability of large numbers of

students to read with a level of critical analysis sufficient to comprehend the complexity of thought and argument found in more demanding texts, whether in literature and science in college, or in wills, contracts and the deliberately confusing public referendum questions citizens encounter in the voting booth.

Multiple studies show that digital screen use may be causing a variety of troubling downstream effects on reading comprehension in older high school and college students. In Stavanger, Norway, psychologist Anne Mangen and her colleagues studied how high school students comprehend the same material in different mediums. Mangen's group asked subjects questions about a short story whose plot had universal student appeal (a lust-filled, love story); half of the students read Jenny, Mon Amour on a Kindle, the other half in paperback. Results indicated that students who read on print were superior in their comprehension to screen-reading peers, particularly in their ability to sequence detail and reconstruct the plot in chronological order.

Ziming Liu from San Jose State University has conducted a series of studies which indicate that the "new norm" in reading is *skimming*, with word-spotting and browsing through the text. Many readers now use an F or Z pattern when reading in which they sample the first line and then word-spot through the rest of the text. When the reading brain skims like this, it reduces time allocated to deep reading processes. In other words, we don't have time to grasp complexity, to understand another's feelings, to perceive beauty, and to create thoughts of the reader's own.

Karin Littau and Andrew Piper have noted another dimension: physicality. Piper, Littau and Anne Mangen's group emphasize that the sense of touch in print reading adds an important redundancy to information – a kind of "geometry" to words, and a spatial "thereness" for text. As Piper notes, human beings need a knowledge of where they are in time and space that allows them to return to things and learn from re-examination – what he calls the "technology of recurrence". The importance of recurrence for both young and older readers involves the ability to go back, to check and evaluate one's understanding of a text. The question, then, is what happens to comprehension when our youth skim on a screen whose lack of spatial thereness discourages "looking back."

US media researchers Lisa Guernsey and Michael Levine, American University's linguist Naomi Baron, and cognitive scientist Tami Katzir from Haifa University have examined the effects of different information mediums, particularly on the young. Katzir's research has found that the negative effects of screen reading can appear as early as fourth and fifth grade - with implications not only for comprehension, but also on the growth of empathy.

The possibility that critical analysis, empathy and other deep reading processes could become the unintended "collateral damage" of our digital culture is not a simple binary issue about print vs digital reading. It is about how we all have begun to read on any medium and how that changes not only what we read, but also the purposes for why we read. Nor is it only about the young. The subtle atrophy of critical analysis and empathy affects us all. It affects our ability to navigate a constant bombardment of information. It incentivizes a retreat to the most familiar silos of unchecked information, which require and receive no analysis, leaving us susceptible to false information and demagoguery.

There's an old rule in neuroscience that does not alter with age: use it or lose it. It is a very hopeful principle when applied to critical thought in the reading brain because it implies *choice*. The story of the changing reading brain is hardly finished. We possess

both the science and the technology to identify and redress the changes in how we read before they become entrenched. If we work to understand exactly what we will lose, alongside the extraordinary new capacities that the digital world has brought us, there is as much reason for excitement as caution.

We need to cultivate a new kind of brain: a "bi-literate" reading brain capable of the deepest forms of thought in either digital or traditional mediums. A great deal hangs on it: the ability of citizens in a vibrant democracy to try on other perspectives and discern truth; the capacity of our children and grandchildren to appreciate and create beauty; and the ability in ourselves to go *beyond* our present glut of information to reach the knowledge and wisdom necessary to sustain a good society.

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