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How Stupid Is Google Making Us?

Nicholas Carr, in his celebrated article, "Is Google Making us Stupid?" (*The Atlantic*, July/August 2008; www.theatlantic.com/doc/200807/google), lamented the fact that he had lost his ability for sustained reading. Carr argued that the longer we work online, the less tolerance we have for "concentration" and "contemplation." He has recently updated his argument in his book, *The Shallows: What the Internet Is Doing to Our Brains* (Norton, 2010).

Carr's original article goes on: "In Google's world, the world we enter when we go online, there's little place for the fuzziness of contemplation. Ambiguity is not an opening for insight but a bug to be fixed. The human brain is just an outdated computer that needs a faster processor and a bigger hard drive." In other words, Google encourages our minds to flit from thing to thing rather than concentrating on following a sustained argument.

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Is it true that the very medium of the new information environment is altering our ways of thinking, as Carr asserts? There is certainly a good deal of evidence that easier access, tied to an abundance of information, is creating a lack of tolerance for the sort of deep research required in a print environment. Some of us are old enough to remember, for example, the tedium of using bound paper journal indexes. Now a few keywords run against a journal database produces a single long list of results, many of which have the full text attached to the citations.

CHALLENGES TO GOOD RESEARCH

This creates challenges for good research on two fronts. First, we are rapidly moving away from the ability to be comprehensive in the information we gather for research, due to the abundance of search results. This means that we are also moving away from an emphasis on taking the time to choose the best results. If they can't acquire all the literature available on a topic, most students choose the "good enough" of picking from the first few results.

Second, there is increasing evidence that we are genuinely becoming less tolerant of lengthy and deep study. This is not simply the result of the new information environment—it's been going on for decades. Something about rapid growth in technology creates a common mantra of "shorter and faster" that calls on us to dispose of the chaff, of inefficiencies, of detail, and get the job done with minimum fuss.

The information world is no less influenced by this than any other part of our lives. In the 1800s, learned book purchasers took the time to cut the pages of their

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new books, even to rebind them in their personal library colors, before spending many hours reading them slowly. Today, we are starting to like the fact that, with an ebook, we can keyword search right to the best stuff without reading much of the book itself.

IBRAIN

Gary Small and Gigi Vorgan, in "Meet Your iBrain" (*Scientific American Mind*, October/November 2008, www.scientificamerican.com/article.cfm?id=your-ibrain; excerpted from *iBrain: Surviving the Technological Alteration of the Modern Mind*, William Morrow, 2008), reported on research done measuring brain function during sessions on the internet, using functional magnetic resonance imaging. While both Digital Natives and digital "immigrants" (newcomers to the digital world) showed similar brain function when reading text, there was a dramatic difference during internet sessions.

The brain activity of Digital Natives in the study was concentrated in the dorsolateral prefrontal cortex, an area that specializes in integration of disparate pieces of data using short-term memory. Those subjects who were new to the internet (digital immigrants) showed minimal activity in this part of the brain at first. Yet, a mere 5 days of experience with the internet had them making active use of the dorsolateral prefrontal cortex, just like Digital Natives.

The result of digital experience is preference for a brain capacity that enhances rapid processing of large amounts of data so that what you don't need is quickly rejected, and what you accept you synthesize into some kind of meaning. Imagine a "shooter" type of video game in which enemy forces are rushing you from all angles. This mental ability would enable you to blast away at will, switching rapidly from one enemy to the next and at the same time avoiding mowing down friends.

However, when you play a fast-moving shooter game, your memory of each enemy will be limited. You may not remember any enemy specifically, because your task is to deal with and dispose of each one as fast as you can. You have no need to put anything into deep memory. That appears to be the sort of brain function used by Digital Natives—it facilitates processing lots of data quickly to eliminate what isn't required or to synthesize what is needed, rather than storing data in deep memory.

The iBrain research is useful on a number of fronts when it comes to determining whether or not the internet has made us stupid. First, both test groups still demonstrated similar brain activity when reading longer text, showing that this function had not been lost altogether. Second, it appears that the brain is able to adapt to the electronic information environment by training itself to use the part that processes large amounts of data more easily. Third, the functions of the dorsolateral prefrontal cortex are not those required for textual reading, deep learning, and long-term memory, so gains in one area of functioning may mean less than optimal use of other parts of the brain. (Small and Vorgan extended their iBrain research in a monograph: *iBrain: Surviving the Technological Alteration of the Modern Mind*. New York: HarperCollins, 2008.)

VERSIONS OF STUPIDITY

Despite the evidence we are seeing that many of those who live digitally are primarily skilled at processing data within short-term memory, I don't believe that Google is making us stupid. Actually, there are several versions of stupidity out there in our diverse world, and few of them explain what is happening to the Net Generation.

Stupidity can be seen by some as a more or less permanent phenomenon in people who simply do not rise above a certain limited level of brain function and understanding. This is not the realm in which the pejorative word "stupid" should be used, because these folks are functioning with realities generally not of their own making. The iBrain research is clearly not involved with this group.

Another form of stupidity is more blatant and infinitely more blameworthy—those who refuse to acknowledge evidence before them but flee to the safety of their prejudices. I won't identify any particular example of this kind of stupidity for fear of setting off a political, religious, or social firestorm, but most of us have seen stupidity, as defined by unexamined bias, and know it when we see it.

A further form of stupidity, closer to home, is the stupidity of otherwise bright people who are lazy with their brains. We might think that this one fits the iBrain phenomenon, but it's not that internet users are not using their brains vigorously, just that they are using a part of their brains not geared to serious long-term study of texts. The long-term brain function is still available to them, but today's digital superstar doesn't access it unless deep reading is called for.

We seem to have communicated to members of the iBrain Generation the idea that they don't need much deep reading, that flitting around the internet meets most of their information needs. This doesn't mean they are stupid, just

that their priorities are different. True, it now appears that we can continuously rewire our brains throughout our lifetimes depending on what we do with them. Thus, the deep reading capability is never actually lost. But our concern is that iBrainers may simply not want to move out of the brain mix in which they currently find themselves.

FEARS FOR THE IBRAIN GENERATION

The ability to handle multiple pieces of data and synthesize them into something that makes sense is not something to disparage. In fact, the iBrain is a significant asset to a technologically based information age. Yet, those who would glibly announce that the old era of books and sustained argument has been replaced by amorphous electronic content are endangering the intellectual underpinnings of our society.

Those of us who educate the iBrain Generation need to ask ourselves how seriously we take the gifts of long reading and following a train of thought that doesn't vanish after a minute. How seriously do we take the value of assimilating content and putting it into long-term memory? Do we really believe that rapid data assimilation in a short-term memory context will serve as an adequate substitute for deep contemplation?

Imagine a new world in which people have amazing strengths in web surfing and data gathering. Quickly making sense of disparate chunks of information, this generation has a shallow knowledgebase but doesn't worry about it. Wikipedia can answer any question as needed.

So where's the problem? It is simply this: Doing arises from knowing. Significant doing arises from significant knowing. As the more traditional educators have been saying for years, skill with information is no substitute for a shallow knowledgebase and lack of emphasis on deep thought. I find myself agreeing with them. This is not an either/or situation. It's both/and. iBrainers do need a knowledgebase and enough deep-thinking ability to optimize the information literacy skills we impart to them. Without this, they may not be stupid, but they will be operating on less than the broad brain functioning needed to make fully educated people.

INFOLIT FOR A COMPLETE EDUCATION

The research process may not be the best venue to help students appreciate the value of deep reading. Students have been doing shallow research at the last minute with minimal thought since long before the electronic age. Yet I believe we have an opportunity to encourage deeper study and deep analysis if we can shape information literacy to optimize use of the parts of the brain that need to be engaged. Here are some suggestions:

First, wherever we have the opportunity to go beyond simply showing students how to use catalogs and databases, we need to challenge them to see that research is a quest, a problem-solving task. It is not an exercise in finding a bunch of sources to synthesize in a slap-dash manner. It is a means to engage the deeper brain function that involves thinking through a problem and evaluating a variety of evidence on the way to a solution. There is no reason why we should only focus on the infolit activities that involve flitting around search boxes and results. Research is a deep-thought exercise if done properly.

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Second, we need to model the time-honored value of stopping and taking stock, something that has grown scarce in the demanding pace of our Google world. We need to demonstrate, even when we are guiding students in an online search, the capacity to pause and really look at what's going on around us. Whether that involves adding facets to our search, rethinking search terminology, or evaluating results, these are opportunities for us to get whole brains working.

Third, and I hesitate to write this in a publication titled *ONLINE*, stressing the value of hard copy is not a bad idea. There is a special pleasure that can come from following a well-reasoned argument in a physical book. Learning to do this can support information literacy in general. Here we need to enlist the aid of teachers and professors who can assign readings and call for evaluations, reviews, and journaling. Teachers often think of reading as absorption of content, but it is also a way to train the brain to use itself holistically. Even Kindles and iPads can do the job as long as the process involves deep reading.

Google is not making us stupid, but it may be making us shallow. We who do infolit can create a generation of deeper thinkers if we take the right steps.

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