

Nicholas Carr's „The Shallows. What the Internet is Doing to Our Brain“ and some implications for Net based learning

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Summary

This paper reviews Nicholas Carr's book “The Shallows. What the Internet is Doing to Our Brain”. Some of the main findings are discussed, such as the influence of the Internet on brain plasticity, cogitation, and concentration. The article then puts these aspects of digital media usage into the context of Net based learning, analysing challenges in various learning environments. The paper concludes with suggestions on supportive designs of learning environments, individual measures, and media literacy.

Imagine, the internet wasn't just a mere assemblage of different media types. And it does not really stay in its physical boundaries of the screen. And let us assume that we are not completely in control of its effects on us. Does this sound alarming? Nicholas Carr, author of the book “The Shallows. What the Internet is Doing to Our Brain” is far from frightening us off the Internet. He is not the man to preach about a supposedly evil technology, rather is he an enthusiastic Net user. Carr focuses on the written word and he takes us with him on a long and complex, sometimes surprising, sometimes entertaining journey through its history. While his focus on writing—and reading—might be limiting in some respect, Carr presents an interesting analysis of the neurological, intellectual, and cultural effects of reading and writing in and with the Net. The aspects he touches in his book are quite numerous, but I will pick some which I find particularly interesting in the context of Net based learning.

Scattered attention

Nicholas Carr had realised at some point of his career that his thinking had become as fragmented as information is presented online, and as a result his ability to focus on one topic for more than a few seconds had ceased. Carr got in touch with other authors, scientists, and bloggers who were experiencing the same alteration in their personal style of work: Skipping from one bit of information to another one, limiting research tools pretty much to one major search engine, jumping to search results without much consideration, and stitching together the results found to form a work on its own. The internet gives us access to information fast and without restriction which was formerly merely accessible. Online communication enables us to discuss with individuals we would otherwise never have been able to meet due to geographical or financial circumstances. Yet, says Carr, “the boons

are real. But they come at a price.” While the net demands our complete attention, it scatters it at the same time.

The ability to concentrate over a longer time span when reading is cut down. Some blogging authors quoted by Carr don't mind this limitation, estimating the advantages of the Internet higher than such effects. But Carr realised that his “brain [...] was demanding to be fed the way the Net fed it [...].” Eventually it occurred to him that “not the way I read has changed, but the way I think.” And how, asks Carr, could this be the case? Isn't our brain supposed to be formed in our childhood and youth and won't change much after adolescence?

Learning and brain structure

Carr takes us on an exploration through the history of modern neurology, introducing scientists who have scrutinised the brain's functions and structure in depth. What early researchers back in the Nineteenth Century assumed and what was denied for a long time, was proven eventually by neurologists of the later Twentieth Century: Our brain does never stop adapting and changing. We actually depend on our brain's high plasticity since this is the key to cope with new situations throughout our life.

The usage of tools of all manners—intellectual or manual—alters our brain's neurological structure. Every new tool demands us to learn something new. These challenges include the tool's usage, its functional capabilities, and its effects on our working and learning practices. In return it also offers us advantages of intellectual or practical kind. At the same time old habits and so far established knowledge is deprecated in favour of the new knowledge. In fact, as neurologists have proven, our brain adapts by assigning new functions to the brain's molecular „workstation“, the neuron, while old functions are „overwritten“. The brain is altered in its plasticity when we learn new stuff like languages, calculations, or software functions. Thus, using new technology and media does change the brain in its very structure and workings.

Reading equals real experiences

Yet, this is only one part of the journey on which Carr takes us with him. Another track we are following him on leads through the history of reading itself. From handwritten scripts to printing technology, from unique manuscripts to mass media, reading and writing has always been a task to be learned, especially since “the ability to concentrate intently over a long period of time“, says Carr, has to be practised and honed, because “the natural state of animal brain is one of distractedness.” This is due to the need to react to changes in the environment instantly in order to find food or to avoid danger. And from this part of the exploration we get to know something quite interesting: Deep, concentrated reading has the same neurological affect on the brain as real life experiences.

Individual memory and culture

Memory is another path to follow in Carr's book. The brain has a certain area to memorize stuff for a short time span. Usually, parts of the storage in the short term memory is further processed and passed on to other brain regions for long term memorisation. Biological long term memory is really the result of a complex process by means of biological, chemical, electrical, and genetic signals. While short term memory changes the way synapses work, long term memory actually changes the brain cell's physiology. Individual memory truly shapes the self, and personal memory shapes and sustains the collective memory. Memory is thus an important part of culture. "Outsource memory," says Carr, "and culture will wither." What he talks about here is the "outsourcing" of biological memory to artificial memory. But the latter is a mere storage of static information, while biological memory is always in a state of progress, changing the brain's structure with every new experience or piece of information.

The overloaded brain

As said before, part of what is stored in the primary memory gets passed on for further processing, the rest is forgotten after a few seconds.¹ The capacity of the short term memory is quite limited. But the internet fills it up with a constant flood of information, bit by bit, second by second, and its capacity is soon exhausted. According to Carr neurologists say, that in the effect no or very little information is processed into the long term memory. Rather is the short term memory regularly flushed to make room for new input. The author puts it this way: "Try reading a book while doing a crossword puzzle; that's the intellectual environment of the Internet."²

Our brain has many functions and tasks, and profound cogitation is one of them. Nicholas Carr emphasises that deep thinking requires a "calm and attentive mind". Psychological studies show that empathy and compassion also require such a settled mind. Taking the speed and velocity as well as the enormous quantity of internet information consumption into account, it might be difficult to develop a calm and attentive mind. Perhaps, this might be a cause for the loss of compassion which is so often criticised in youth.

Distraction in online learning environments

While "The Shallows" rather describes a *status quo*, we can extract some conclusions from it and try to apply them to the practice of Net based learning. This might require at first to define the term 'Net based learning'. In this paper I use the term for any learning activity that is situated in the broader context of internet connections, e.g. formal learning in Net based LMS, researching and documenting within online collaboration tools like wikis, informal learning with public groups, or selfpaced learning with

1 The primary memory model has been replaced with Baddeley's model of the working memory, see Baddeley, Alan D. (2003)

2 Apart from the different concepts of primary and working memory, Baddeley too proved the effect of distractions on memorisation, see Baddeley, Alan D. (2002)

commercial content. Such learning environments have in common that they are solely accessible by internet connections, and thus a participant has to be online and, by means of interactivity, accessible too. Net based learning environments offer a great deal of advantages, yet taking into account what Carr has researched, it might also obscure learning by offering, or rather imposing distractions. This is most obvious in public informal learning situations.

A wiki, for instance, is a marvellous tool to collaboratively explore topics. However, adverts can be displayed to generate revenue in order to pay hosting costs, and the typical hypertextual wiki structure itself can easily lead into directions which have little or nothing to do with the original subject matter. At the same time it is one of a wiki's strengths to offer easy access to linked content. Thus wiki users have to learn how to use this specific technological environment without getting distracted and eventually lost. Or, in other terms, how to focus on their topic at hand, and distinguish relevant from irrelevant additional content. The same strategy applies to the use of other learning material and learning environments presented in the Net.

Strategies to learn effectively

While distraction is one aspect to reckon with, scattered attention is another one. Although it looks like the same problem at first glance, it has a different effect. When distracted one strays off course and explores differing subjects, yet this might still be in a state of concentration. Having attention interrupted repeatedly rather leads to a likewise discontinued behavior, e.g. checking emails repeatedly, reading and writing tweets³, back on the original paper or website reading on for a couple minutes, and then checking on social network connections again, and so forth. In the effect the working memory is constantly filled with new information in a pace faster than information can be processed. There is little chance thus to get anything deeper down into memory, and the learning success will be smaller than it could be in a calmer environment. Learning online effectively thus demands certain rules to prevent occupation with anything else than the learning matter. One of these quite simple rules could be to shut down any communication client, be it instant messengers or email software, or to disable automated notification on received messages. When working on a paper locally, it might even be a good idea to disable the internet connection completely temporarily. This shouldn't sound too revolutionary to anyone, yet it might feel quite unusual. Additionally, switching off mobile phone communication functions will be helpful.

Those are individual measures, yet the learning environment itself should be set up in such a way that it supports learners the utmost in accomplishing

³ Tweet = a message on twitter.com

their goals. This demands to design a proximity with a balanced relation of both, typical and necessary communication and researching tools, and a space that enables concentration without distraction. Designers and administrators have to find ways to incorporate desired functionalities while building visually clear and non-distractive surroundings. It is also necessary to equip learners with the competences needed for successful Net based learning. Media literacy should include the ability to build one's individual optimal learning and working environment. Specific courses and materials will be helpful as well as peer-to-peer support and one-on-one coaching.

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