Text, Textuality and Digital Media
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Lecture 28
Nicholas Carr: Juggler's Brain

Carr in his book the shallows discusses the effects of the Internet and the various instances of the digital media on the human brain and the way the mind works. I would like to refer you back to our earlier discussions led by Walter Wong on the effects of print and the coming of writing on the brain on the human mind. The fact that print led to a more analytical form of form of reading and understanding of texts which is very different from that of the oral domain, because in print one presents material in a linear fashion, in a sequential fashion, one after another, and that is what dominant forms of narratives, since the emergence of the era of mechanical reproduction, even films, and every other form work in that fashion.

It is only with the coming of the digital, so if you can imagine the older audio tapes, you know cassette recorders, in which if one had to move from one point to the other, one had to sort of scroll through it and had to rewind or fast-forward it and reach that position you had to go through all that material before you reached a certain point and if one entered a cinema hall and watching a movie you had to sit through that entire thing or you had to just enter the cinema hall at or the screening at a particular point if wanted to have a look at that, at a particular scene.

But today we always keep on skipping through videos, we do a rush all the time to figure out the part of the video that is most interesting and tools have become much easier and more accessible to be able to clip and share videos and the same is true in terms of the text where we looked at in detail how the hypertext actually works where the sequence is broken. Now what is the effect of this kind of a work environment on the brain, this is something that that Nicolas Carr sort of looks at in this book.

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But we are going to concentrate on one particular chapter which is on the jugglers brain. I encourage you to read this book by Nicholas Carr. So he says that the net is a form in which there are, he says the net is really the latest in the long series of tools that have helped humans mold their mind. I mean the human mind gets molded by this particular tool of the internet and the way the internet actually works. It is not so much only the internet, but the interface of the internet with the browser, and the various applications, and the various devices through which human beings are constantly connected and operating the various ringtones the various notifications the various tabs on the browser page.

That entire environment of connectedness ,that is something that he says is going to have sort of a prolonged effect on the human mind and he says that this actually promotes cursory reading. If you are reader of new stories or various kinds of articles on the internet you would find that more and more content providers are now giving an estimate of what would be the reading time of a particular article and find more and more the kind of articles that are getting shared are the ones which have a very short reading span, not more than 10 minutes, and some of them could be meant for only 6 or 7 minutes.

This is a result of the fact that the human mind is becoming more and more distracted and one is not able to concentrate on one thing for a very long period of time and that is something that is

also resulting into more distraction in the form of shorter reads. The only way to really train the human mind to be able to not be distracted is to actually take the mind to go through the longer pieces of work. There are films or texts that train the human mind to actually engage in sort of longer forms of texts more engaged forms of texts.

Even today we find that with the coming of various for video sharing platforms or even platforms which share online movie entertainment or serials, TV shows, and others. If there is a movie you find that people rarely do watch the entire movie at once, they watch it in parts at various points of time in the day or through the week and that is why you find that more and more of these online entertainment platforms they are moving towards these shows which are shorter. I mean a single episode would not be more than 25 minutes or so and that is sort of the maximum attention span that a passive medium like the screen can have, a movie can have, television can have.

In terms of, and this is also showing in academic circles, where we find that there are more and more now you do not have hour-long lectures at conferences anymore, you have shorter lectures, you have people presenting a maximum of 15 minutes issues probably for the attention span. So most of my lectures are an hour long, so it is a little bit of a strain I am sure on students to be able to concentrate for about an hour but that is because of the fact that the classroom environment is supposed to be one that trained students to be able to pay attention, and what are the effects of it is something that we will discuss.

But increasingly we find in the classroom students sit in the classroom they have either their laptops open they are checking their mail or they have their mobile phones around and they are looking into the phones and they are actually taking in a whole lot more than what is being taught in the classroom, what is being discussed in the classroom by the teacher. One can debate and say that whether this is something that is negative or positive.

Some people can say that you know the students would actually look up material related to the lecture, immediately open the Wikipedia page on a certain term which is being discussed. Sometimes maybe contradicting in a live classroom, maybe not in this particular lecture, but in a live classroom maybe sometimes contradict the teacher and say that, I know what you said is not right because on this website this is what they say, when I have had that happen to me.

But one also shares a bit of concern that what is this kind of distracted form of thinking sort of leading to, in terms of a human ability and human cognition. And Carr certainly believes, and he has certain experiments which he is going to refer to, that this is leading to more superficial forms of learning and is having a very lasting effect on the human mind. He says that the digital media or the Internet is not a technology that rewards deep thinking and it only stimulates certain an immediate sensory or cognitive stimuli. And what he says is that it delivers a sort of cognitive and sensory stimuli which are interactive they are repetitive intensive and addictive.

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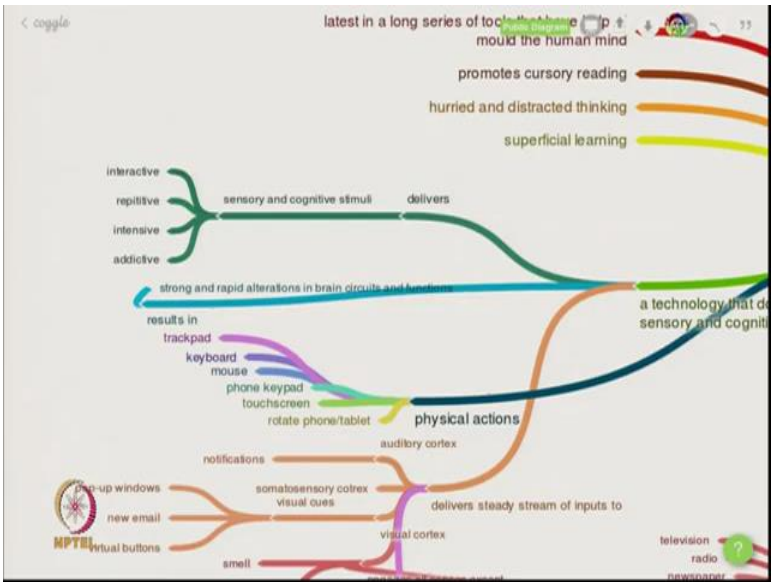

Because certain researchers have said that some of the secretions that happen in the human body at the time of this kind of social media interaction and being connected and looking at constant updates from friends and other online friends really is similar to that which are produced by addictive substances and that is something that is really dangerous and it says that this sort of interaction results in a very strong and rapid alteration in brain circuits and functions because there are various parts of the brain, various neuron circuits, which are responsible for certain activities or are storehouses of certain skills or memory

And if one is constantly shifting between one particular stimuli to another the brain is constantly having to shift from one stimuli to another, there is a certain kind of multitasking that happens, and the brain has to adapt to that kind of multitasking atmosphere.

And it says that typically we recognize that we are constantly having to shift between various kinds of physical actions, you have to look at the trackpad, the keyboard, the mouse, the phone keypad, the touchscreen. At this present moment I am looking at several devices, there is a clock for example, there is a screen, there is a camera, and there is this computer right in front of me, and I have to operate it through the screen. I know that there is somebody who is recording and he is working so I am not merely teaching, parts of my brain are constantly distracted with these other functions.

And therefore if it were a normal everyday classroom, I probably have my notes in front of me, and I sometimes just let off my notes and talk to the students and engage with the students and in this particular kind of atmosphere that is there in this particular form of an online classroom a very crucial element all these devices are there.

But I do not have a have any human interaction with you, who are the students, which pretty much sort of sums up the digital environment where we are all connected but we would hardly talk to each other. We might meet somebody on the road and not recognize that person. I have had several times that people have come up to me and said I am on your friends list and I said oh wow that is that is great, but you know that kind of relationship does not stem from a one-on-one interaction.

We can say that, but whether that is good or bad without making a value judgment, but it is certainly a very different form of human interaction and therefore what a one-on-one interaction does is that I am looking at that person completely I am taking visual and verbal clues from that person. Physical cues, I can see how they are moving their bodies and how they are responding whereas in the case of online interaction the only cue really that you can get is how long has it taken for that other person to respond whether the person is online whether the person is typing whether the person is seeing the message or not, so the human mind is constantly looking for these kind of clues.

Whereas when I am talking to the person, I can see whether the person is listening to me or not or playing with this phone. So you have had these kind of situations. People go to museums and instead of looking at the artifact or people visit tourist places instead of looking at that site or that particular structure or whatever with their own eyes they constantly are interested in taking

photographs or selfies and as a result they are probably left with no real memory of that place other than through the photographs

And so the human memory sort of keeps getting weakened further. We have begun with this from Plato, who suggested that writing is something that is giving, making, leading to a loss of any sort of human memory, and we have come to the age of the Internet where we really do not need to remember anything. We need to remember lesser and lesser because we can always search it up in our favorite search engine and that will give us whatever is required. We do not need to remember spellings because spell check will work on it.

And so these are some of the changes in the kind of way the human brain is functioning and Carr discusses some of them and what the effects of these changes in human behavior are on the human mind on a long-term basis.

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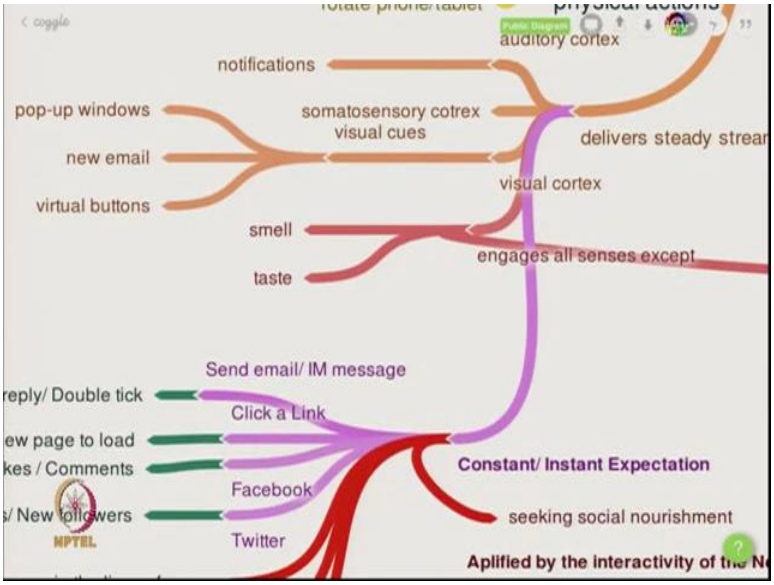

Now he says that each of these physical actions deliver a sort of steady stream of inputs to the various parts of the brain, the auditory cortex, constantly. There are these notifications in fact you can set separate tones for notifications for separate apps or when there is a message on a messaging group or whatsapp there can be a certain tone, if it is coming from a different kind of messenger then there could be a different tone, if there is an email there is a different tone, if there is a text message there is a different tone.

So you are constantly keeping tab while you are working. When you are concentrating on something, the notifications keep coming so the mind gets stimulated by that. There is the somatosensory cortex which will show you where you are working on the computer, there are pop-up windows, there are visual notifications that come, as new email comes it makes a sound, there are virtual buttons that pop up requiring you to cancel something or say ok to something or to agree with something else, all senses by and large except really the smell and the taste have been engaged. Who knows in the future even the smell and the taste can also be engaged.

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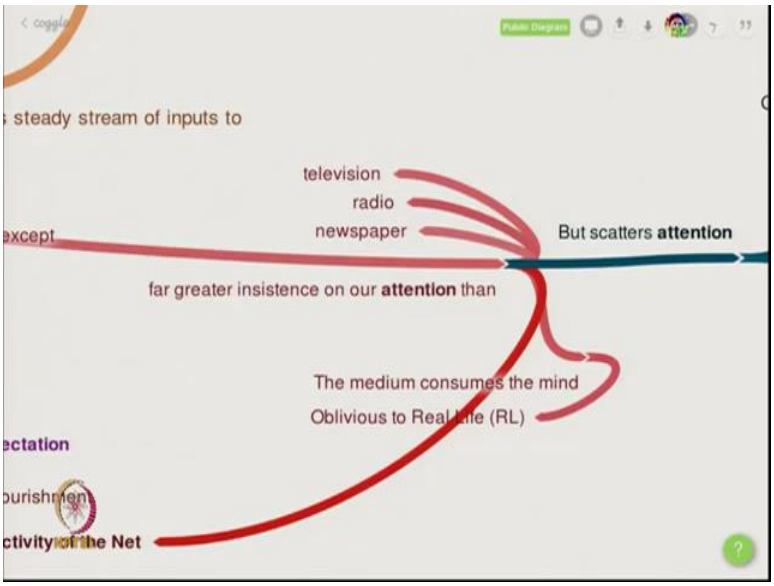

So what this leads to is that the internet, he says, insists on far greater insistence on our attention than previous kinds of media, the television, radio, newspaper. But the power of this kind of attention is that it is not sustained attention, it constantly scatters attention, that is the attention is divided among many activities which are constantly there in the mind. We have some people even talk metaphorically in terms of the way modern day living is, that we have constantly in our lives many browser windows open when we are trying to do various things at the same point of time.

Because even if we look at the reflection in terms of work hours, if you see the process of the Industrial Revolution, there was a change in which people moved to the factories after urbanization and you had this clear distinction between leisure time and work time where you

had certain number of hours. Initially the number of hours of working for those who are engaged in manual labor were very very long, up to 16-17 hours or even more than that in certain cases.

But you know after the after the Chicago Revolution eight hours became a standard work time for people and then you have eight hours for sleep and eight hours for leisure and that distinction. And it was and some of these leisure activities that led to certain cultural imports and the growth of the novels was something that was very important which emerged from this kind of growth of the leisure time.

But with the digital media now that distinction between leisure and work is really removed. It is not that you have that distinction not there in the same way as it was in the pre-industrial era. In the pre-industrial era, the people would certainly have some leisure time but it will not be defined by clock time, that it would be more seasonal, it would be more diagonal depending on what time of the day it is how the crops are doing or how a particular kind of work is doing. Whereas in the factory everybody has to report to work at a specific shift at a specific point of time.

Whereas now we have a situation where people carry work home the only real machine that people tend to work on is the laptop or the computer and they can work from anywhere. So more and more people are working from home. But there is no home time, they are working all the time, working on the emails, people spend a lot of time answering emails, especially people in the Academia spend a lot of time responding to emails which keep coming at various points of time in the day sometimes requiring immediate attention and that sort of…

So this kind of an atmosphere where there is this constant needs work-related or leisure related, in fact leisure related, activities could also happen during work hours so to say you can get a text message from a personal group and you would like to respond to it at that point of time. So this kind of a distinction between work and leisure is getting obliterated, getting murkier as we speak.

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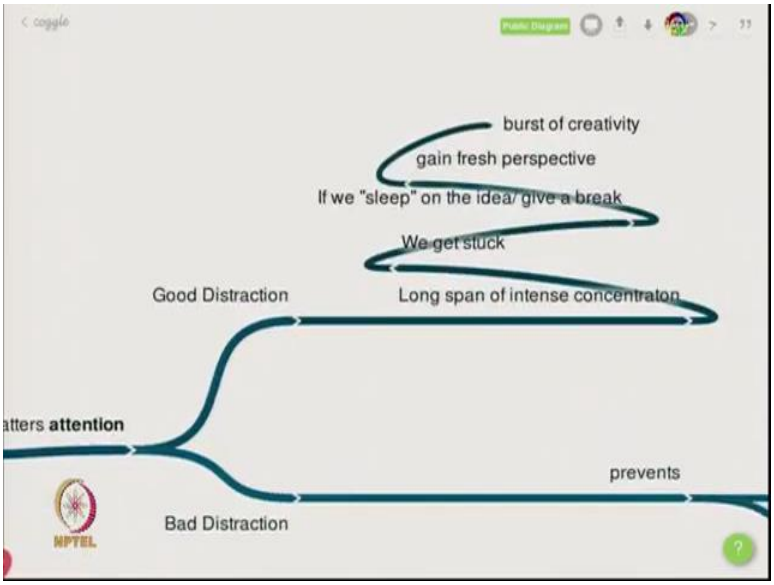

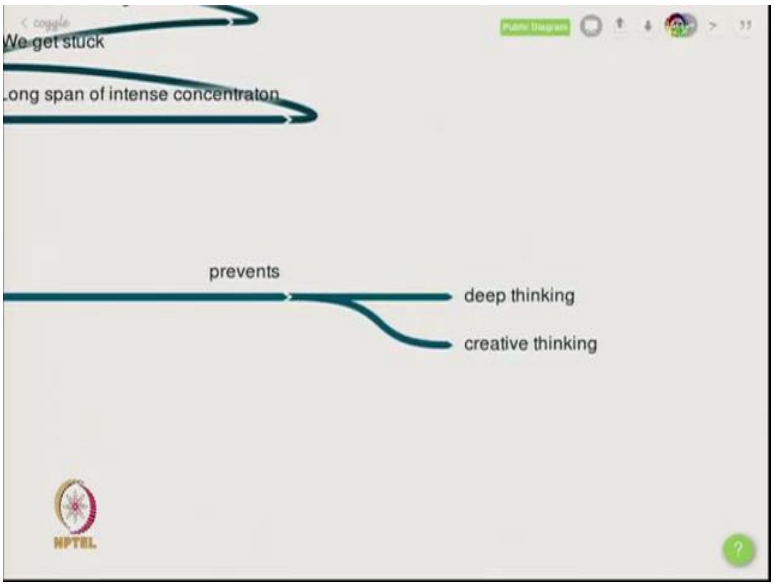

Now he says that though this distracted way of thinking sort of scatters the attention, he says that distraction can be of two kinds. There is good distraction when let us say when we are working with great amount of concentration for a very long period of time, we are stuck with the problem you are not able to solve it then we take a break we either sleep or go for a movie or play some sport, go for a walk and suddenly find that you have got a new breakthrough, you got an idea through which you solve the problem.

So the good distraction sort of allows the mind. In fact sleep is very important, we understand what happens with sleep is the mind actually re orders itself and makes it easier for people to understand or remember things.

And there is the case of bad distraction he says the bad distraction prevents deep thinking and creative thinking. The bad distraction is that which is in the form of the way the Internet operates where you are distracted at every moment, not distracted after long bursts of activity of a particular activity with a particular phase of concentration. So that is what he says.

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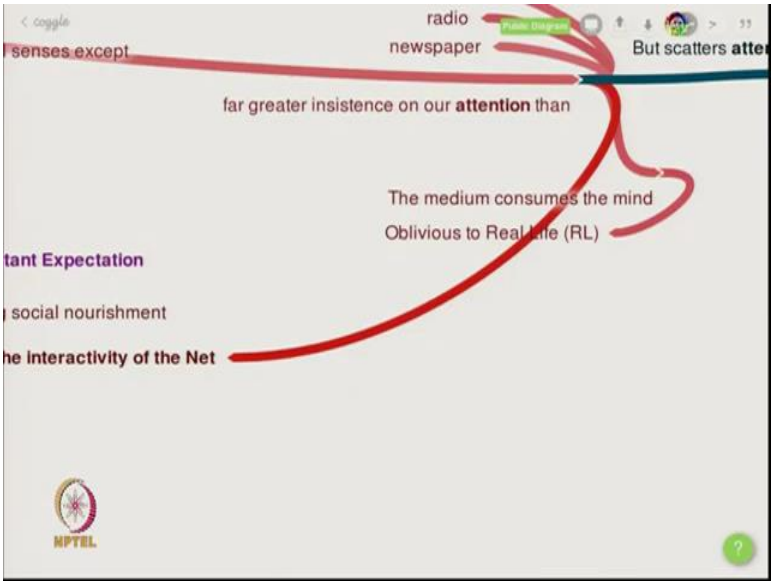

This medium consumes our mind, almost oblivious to real life, this is proverbially the person crossing the road while looking at the mobile phone where he is completely oblivious, or people driving while using the mobile phone, even in fact trying to text which is extremely dangerous. I

hope none of us ever do it. But that is the kind of obliviousness to real life so there is the virtual life and the real life. So there is this expression here and this obliviousness is sort of amplified with the interactivity of the net the point that could constantly have to respond to something you know.

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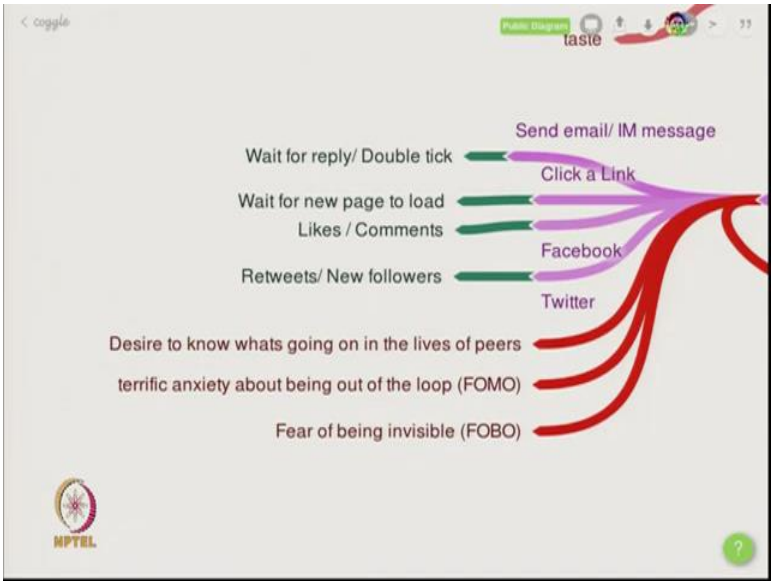

So this constant expectation of getting a response is something that is extremely disconcerting. There is a constant desire to send an email or a message and then you wait for a reply or a double-tick there. Why is this person taking so long to respond why is it not responding. Sometimes people would call up and say why have not you responded to my message did you see that photograph I sent. And then if you click a link then you wait for the page to load and sometimes when before the page loads you start checking something on some app on the on the phone.

So because the page is taking some time to load, or as constantly when you post something on maybe on Facebook or on Twitter you check what kind of responses, whether somebody has commented on it how many likes have we gathered. This entire thing about chasing the number of likes that are there how do I manage to post something which will gather more retweets and more likes that gets into that kind of a competitiveness.

If someone responds to my comment I get back, so you just take the timeline and you see that somebody is responding, people are responding to each other in a matter of seconds or minutes

which is recorded there. And really it generates this kind of a desire to know what is happening, what is going on in the lives of one's peers, really speaking. And these lead to certain kind of terms like FOMO or the fear of missing out, a fear of being out of the loop.

And the more dangerous one really is the fear of being invisible, being outside. This has a sense of connectedness, constantly wanting to check what is going on in that online and digital space and all this is having a certain effect on the human mind, which something that Nikolas Carr is talking about.

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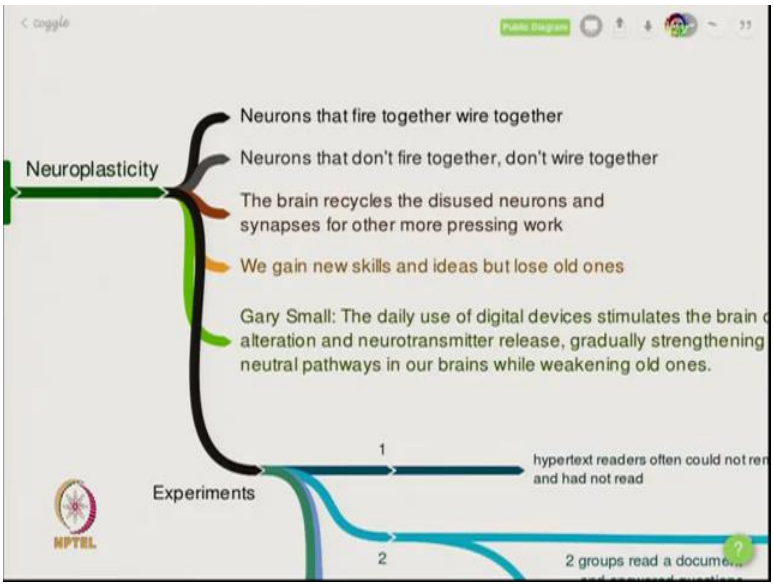

And because the net is interacting with the human brain and he takes us through this understanding of the way the mind actually works, the neuroplasticity and says that that the human mind is made of neurons and it is the neurons that make, the synapses between the neurons make memory possible, make skills possible.

So when we are learning something, what is happening to our brains is that the neurons are getting reordered. It is almost like a hard drive, if you think of our computer hard drive, there is there are these magnetic strips or particles which are getting reordered either a zero or as one and the larger sets of those or what you call bytes or megabytes or terabytes gigabytes.

And that is how any disk is ordered and this disk moves at a very fast pace and the head reads the messages, the signals, which are stored within the disk. Now when we delete something from the

disk something else gets rewritten, and what happens is that, the way it works within the computer disk is that, when you delete something, it just creates a certain amount of space randomly on the disk. So if you are trying to write a large set of data the computer may not be able to immediately find a contiguous space within the disk that puts that entire data together.

Now what it does is that it allocates the data to whatever empty spots on the disk that it might find. So a certain song or a certain film could be written at various parts of the disk. Now when you trying to read that song or the movie, what the head has to do is it has to check the entire disk for a particular part of that song and that slows down the activity.

So therefore you find that sometimes on certain operating systems you have the system of deep fragmentation where you get rid of these fragmented files and you make them contiguous. You put all the files related to each other or all the parts of a certain file together and that makes the performance of the computer a whole lot better. It responds to user requests a whole lot better and something similar is happening to our brain as well.

As Carr says, neurons that fire together wire together. That is, the kind of brain circuits which work with each other, they are the ones which learn to work together. And neurons that do not fire together do not wire together. So what is happening is that every time you are picking up a new skill, the neurons are creating, they are falling on top of one another and creating these synapses these junctions, and when we are engaged in some other activity the brain has to pull up certain neurons and it picks up the unused ones and turns them around.

And that is why when we revise a certain lesson or we go back and practice so a certain sporting skill or something, what happens is that neuron comes back to its earlier place and more and more as we keep practicing as we keep revising, that neuron gets solidified. The more you revise something or you engage in something at greater intervals the more long term that memory would be.

But if we are engaged in too many activities at the same point of time, then the neurons hardly get to form these strong connections with each other. The synapses are not very strong, the same neurons are getting used for multiple activities at the same point of time and therefore these bonds are not very strong. It might lead to other kinds of skills, one can say that multitasking is a very good skill for various kinds of things, your reaction time to for things get reduced, you are

immediately able to respond to certain things. But the one thing that it does not lead to is sustained cognition and certainly rational thinking scientific ways of thinking operate on the ability to think deeply.

So Carr quotes Gary Small to say that the daily use of digital devices stimulates this brain cell alteration and neurotransmitter release, gradually strengthening new neural pathways in our brains while weakening old ones. So the older bonds get reduced.

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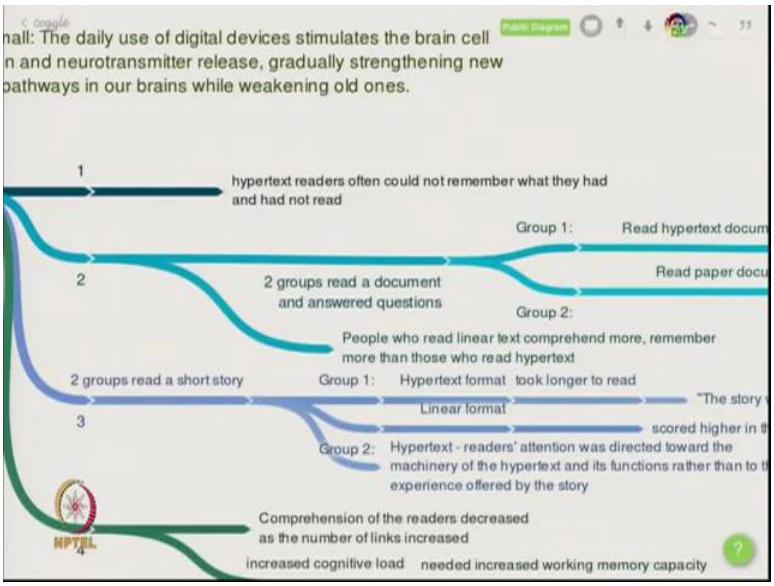

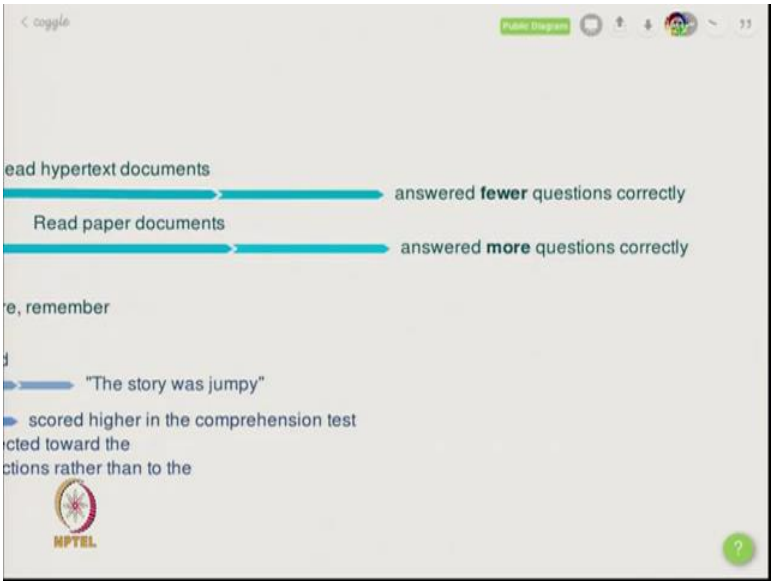

So then he talks of certain experiments. Let us take them one by one. The first experiment they find that hypertext readers often could not remember what they had not heard, what they had or had not heard, people who are reading hypertext are not able to, because the recall ability is much less because your mind is a also engaged in seeking out that path. We did talk about the way in which in the case of a novel or on a movie you are you are presented with the authorial sequence the sequence of events as chosen by the author.

Whereas in the case of hypertext the reader has a certain choice but reader has to exercise that choice at the same point of time. If you have a TV program or a movie show where you are constantly required to use the touchscreen and choose which direction the narrative should take, you are engaged in that decision-making process. You are not engaged in the narrative anymore with that kind of depth. So that there is a loss of that depth and he says that experiments show that hypertext readers could often not remember whether they had read something or not read something so it leads to a loss of cognition and also leads to a loss of understanding.

So then in experiment two, they had two groups read a certain document and answer question so Group one read hypertext documents and group two read paper document and they find that those who read the hypertext documents actually answered fewer questions correctly then paper. So it says that people who read linear text tend to comprehend more, understand more, and remember more than those who read hypertext the connectedness the sequence the causality of the story can be broken.

Then another experiment there are two groups who read a short story and group one looked at it in hypertext format. They took longer to read and their reaction was that the story was jumpy. But the story was not jumpy, the format was really jumpy. Whereas group two looked at it in linear format and scored higher in comprehension. So therefore we find that in hypertext the reader is attention was more occupied by the machinery of the hypertext rather than experiencing the story itself.

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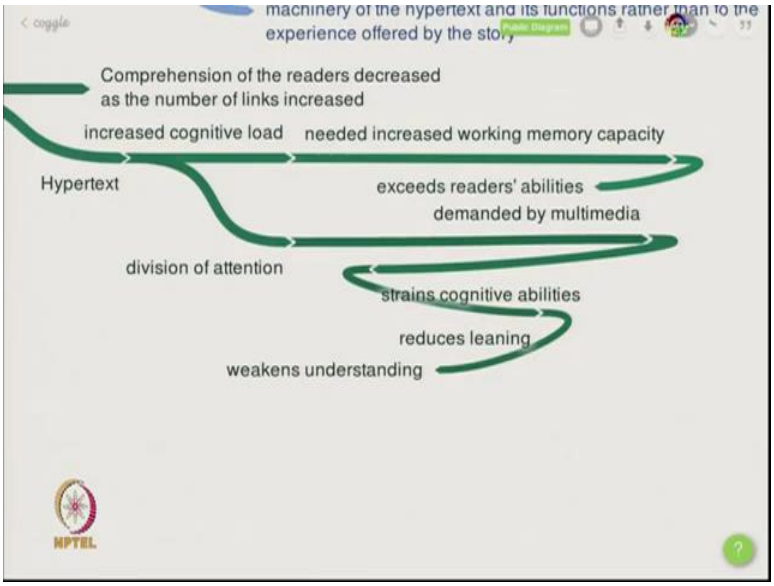

So in these kind of experiments, the point being made is that comprehension of readers decrease as the number of links increase. If you present two hypertext articles, one with more number of links and the other a lesser number of links, as there are more number of links comprehension reduces because hypertext increases the cognitive load and increased the needed working memory capacity, and so this division of attention within a multimedia internet atmosphere strains the cognitive abilities, reduces learning, and weakens understanding.

So now this is something that one is not sure how to respond to, because what the long-term social effects of this thing, this kind of activity, are going to be is something that time will tell. But this kind of experiments are showing that you have a certain decisive change in the way the human brain is really working and operating and if we go back to the earlier understanding of the coming of mechanical reproduction of print and writing which increases analytical reading and increases the ability of the human mind compare, contrast, and verify what are the effects of this kind of distracted reading on it.

More experiments and more studies are required and whether it really has an effect on the rational behavior on scientific inquiry is something for us to see. And since we looked at print and we looked at print as one a very important survey element, important input into the making of modern forms of politics of democracy what are the effects of this kind of disconnectedness

are on political systems the future of democracy is also something that would be interesting to follow.

KEYWORDS:

Nicholas Carr, Juggler's Brain, Walter Wong, Internet, Linear, Digital, Hypertext, Applications, Notifications, Distractions, Attention, Creative, Neuron, Synapses, Sensory Stimuli, Addictive, Fragmentation