

Understanding Mind: Modifying teaching and learning

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Abstract : I want to present a few facts which may be considered to modify how and what we provide to kids in our education system. There are facts like:

The human brain can concentrate for only 30 minutes in a go. The attention span of human brain has gone lower than a goldfish. Use of new communication technology has made us distracted and dumb.

Touch can sync human brains. Should there be some research into it on how to utilize this into teaching our kids?

99% of our decision is taken at subconscious level. There is a relationship between fear, anxiety, low self-esteem and low grades.

It's all about chemical reactions. There are theories which hold that brain states are identical to mental states.

Good sleep is important for critical thinking. If you wake up for extra hours your mind starts eating itself.

Loss of Memory or poor memory relates to abusive life and low grades.

Brain needs fats.

Beauty products make the mind numb because they contain lead. Simplicity is beautiful.

Neurons that fire together wire together. Practice makes a man perfect.

We have some 60,000 thoughts per day.

The above mentioned facts are back by the studies mentioned in the bibliography. And I will carve out a picture as to how these studies can help us enrich the educational curriculum.

Keywords: Mind, Teaching, Learning, Memory, Critical thinking etc.

The aim of this paper is to see how the new researches in neuroscience can be studied and incorporated to improve classroom, teaching and learning.

Firstly, we see that, brain needs fats. Therefore, Children should not be encouraged to eat “healthy food” which has less cholesterol. The glamour industry as well as the mindset of parents is equally responsible for asking girl kids to stay slim and consume foods with lesser fats. Even boys are under the same pressure now-a-days. The common person doesn't change with the advancement of scientific research, he or she tend to be under the influence of the media and popular culture.

Cholesterol and saturated fat are important for mind vitally. People can have risk of Dementia reduced to 36% incase they consume saturated fats like Ghee, Butter etc. “Saturated fat is a fundamental building block for brain cells”. And as a matter of fact human breast milk has the highest amount of the saturated fats. The Cholesterol level is inversely related to the risk of Dementia. The elderly people who have high cholesterol levels have risk of Dementia reduced to almost 70%. It shows how cholesterol is so much vital for better health and functioning of the brain. Cholesterol is more than merely a protective antioxidant for the brain. It acts as the raw-material that enables our bodies to manufacture vitamin D. This vitamin D is a fundamental player in keep brain healthy and preserving its function. Cholesterol is also the precursor for the sex hormones viz: estrogen, progesterone and testosterone – all these hormones have been found to be very important for mind to stay healthy and function properly. “While the brain constitutes about 2-3% of our total body weight, an impressive 25% of the body's cholesterol is found in the brain”.

Brain needs fats. To be more mentally active a good intake of fats by food is important. But the glamour Industry in India is such that it is promoting anorexia. Eatables containing fats are abhorred. Moreover market of make-up products has increased manifolds due to the fact that the glamour industry promotes it. And all make-up products contain heavy metals like lead which make mind numb.

Secondly, holding hands can synchronise brainwaves.

Pavel Goldstein lead researcher in the University of Colorado Boulder researched on interpersonal synchronisation. He tested it in lab on 22 hetro-sexual couples. The conclusion is that the bodies synchronise with each other in multiple ways. He concludes that holding the hand of a loved one can even decrease the pain. He first intuited about this when he was with his wife. His wife was in hospital and was to give birth to his daughter. He had held her hand all this while and it literally eased off her labour pain.

When tested in lab, 22 hetro-sexual couples were listed. All aged from 23 to 32. Each of the couple had been living together for one year or more. Their brain waves were mapped or observed through the electroencephalography (EEG) caps that they all were to wear for the test. The brain-waves of each couple were recorded and mapped in the following scenarios: one, sitting together, but not touching each other; two, sitting together and holding each others' hands; and three, sitting in different rooms. And then the scenes were repeated while applying pain to woman's hand in each couple in each scene.

The results are as follows: there was synchronisation of brain waves of the couple when the persons were in the same room, irrespective of whether they were holding hands or not. The brain waves corresponded to the portion of the mind which controlled voluntary actions. The synchronisation of the brain waves of the couple was finest when the persons were holding the hand and the woman was in pain. Moreover, not holding hand when the woman was in pain decreased the sync between the couple. Why it happens is still not clear.

The phenomena of syncing are found in pendulum clocks as well, but this is a physical phenomena and it has been solved.

My conclusion is that accessing the feelings, emotions or mental states of others is not even that big a deal. After all, all the human languages have been developed in the process of and for the purpose of understanding each others' mental states in a better way. The content, of whatever is said in a language, attains its meaning by its capacity to represent or communicate the mental state of the communicator. And touch, has proven to be a nice way to be a syncing force. May be with further research we can understand how to sync one's brain wave with any random person's brain wave to catch up to his qualia. So now there is a hole in the definition of qualia as experience feelings and sensations which are inaccessible. The material basis of the experience of pain is brain and brain waves can be communicated. Pain is a widely given example of qualia. It is said time and again that even though you know that the other person is in pain you cannot feel it. But, the above mentioned study has put a question mark on this opinion as well as the current definition of qualia. At least, if we do not wish to change the definition of qualia, we can say that 'pain' as a sensation is not an example of the statements that the definition of qualia make.

Because, touch can synch the brains, it is very important to see who your kids hang out with. It's the mindset of friend circle and not the standard of their clothes and accessories that matters at the end of the day. It is found that people who are friends have got to show same brain areas lighted when given the same situation. Their likes and dislikes may get synched.

Mention the study:

Thirdly, 99% decisions are taken at subconscious level by the mind .

Therefore, they may be guided by reason, passion or merely our habit. Point is we have just no control over it when we take a decision. It does not mean that we are not agencies of our actions. It only means that our "thinking", our mindset defines us most of the time. So the question is how you control and shape the thoughts which finally shape and control you. We can find out what factors influence and shape mindset like education, socializing etc, and control them in such a way that a kid grows up as a good citizen. Right now in developing countries especially we have our kids educated according to the industries. Our coursework are designed to meet the needs of the industries. Industries in present times need labourers at the competitive prices. Therefore we are having such an education system which is competitive without providing much depth and understanding. Results are that we don't produce good, deep, serious research works. So, rote learning is there in our education system.

A recent study on cognitive dissonance shows how we can rational decision making a habit. That will help us get to right decisions even if the decisions are taken at subconscious level. The study holds that there occurs cognitive dissonance when one has two conflicting options for enacting. Suppose you like chocolate and want to have them. But you are fat and you know that it's not good for you. In this case you are having conflicting mental states. The decision to have chocolate would be an emotional one. And the decision not to have the chocolate would be rational one. Children are more passionate and emotional than rational in taking a decision. They have lesser control over their desires. Their desires should not be suppressed through punishments. But, one can be trained to make rational decision through Logic-based cognitive-behaviour therapy. The therapy involves the effort and training to overcome the irrational choice seeing the rationality of the alternative step or option. It involves training into thinking logically, syllogistically and training one's will in overcoming one's desire to bend towards reason. This done frequently and consistently, it may become a habit. This may help in the overall development of the children where they would be less prone to resort to act out of passion when they grow-up and there would be less criminal cases which occur only as an act of passion.

Fourthly, the attention span of new generation is lower than even goldfish.

The goldfish has the attention span of 7 seconds and human babies have only 5 to 6 seconds of attention span. In such a case large classrooms having thousands of students in top government colleges only lead to poor results thanks to a lot of distraction. In many government schools and even private schools the strength of a class goes till 200 students per teacher. This has to be checked.

One can see that malnourishment may contribute to the low attention span. The world's most malnourished kids live in India. Here, 60% of the children are malnourished. They are malnourished because their parents are poor and uneducated. The breastfeeding makes mind grow healthier in babies. Another thing is that a child once malnourished till age 6 faces the repercussions throughout the life. It cannot be compensated at any point of time in life. Therefore malnourishment may translate to underperformance of students. India is a country where 1% people have 99% of wealth.

Moreover the electronic gadgets only add to the problem of attention deficit. How many hours students spend with gadgets should be fixed.

Fifthly, a good sleep is crucial to critical thinking.

Therefore students should not be encouraged to burn midnight oil and lose their sleep. The working hours should be so decided that students don't have to compromise with their sleep. Also, the contents and length of the syllabus should be decided accordingly. The examination system should not be such that students are overwhelmed. If you starve yourself of sleep your brain starts eating itself.

During sleep mind flushes off neurotoxins, through cerebrospinal fluids, which are connected to Alzheimer's disease . "During the day, the CSF mostly covers the surface of the brain. During sleep, though, the CSF is able to move deep inside," the report said .

Memory and emotional health are related. Therefore, emotional health of the students in their school age and even pre-school age should be constantly checked.

Moreover, brain keeps on producing new cells even during old-age. Therefore, even old people are capable of learning new things and have good memories. The regular exercise is a good way to produce more neurons.

But, poor memory is related to increase of size of amygdala in brain which in turn happens due to chronic abuse, stress and anxiety during childhood. The impact of such abuse may be visible even after 20 years of our coming out of the abusive relationship. The meditation may help in reducing the size of amygdala. Though the process is slow and it does not bring back the amygdala to the original healthy size.

Sixthly, we construct false memories. But why does mind do it? Most of the time mind constructs false memories to develop a coherent story out of various episodes of some events. Remembering is a reconstructive process-highly reconstructive. Even when you correctly remember something it can be highly inaccurate or false. Memories are malleable.

"If we can understand the mechanisms that allow people to do this, the hope is that we can replicate them within our AI systems, providing them with a much greater capacity for rapidly solving novel problems" the report said.

Seventhly, Multi-tasking makes us dumb.

There are times when we try to overwork ourselves and end up doing multiple tasks which just leaves us feeling stupid in the end. Now there are studies in neuroscience which show that our brains can only focus on one thing at a time and that we are not having our brains wired in such a way that we can multitask. When we are multi-tasking our minds need to switch back and forth constantly and that causes more error and costs at least 40 % of one's productive time. Above that one has to have a very good short-term memory to be a multitasking person. During multitasking you need to store more information in your working memory. And the processing of the information received become less effective and efficient causing more errors and gaps.

It becomes slow too as we have seen earlier. Therefore students should not be taught multiple subjects in one day. Instead they should study just a few subjects for some numbers of days. And those subjects should be taught in details because the mind takes less effort in processing same kind of information. It's easier to store more information of the same kind in the working memory. Moreover as we have seen earlier we know that neurons that fire together wire together. Therefore doing the same kind of thing for a good time makes students trained to that more efficiently and effectively. So we can have a coursework in school where we learn science one week and mathematics another week and have weekly test for each subjects. And then we can move on to other subjects.

As a matter of fact, our brain has to have a down-time to process information, and jobs like turning short term memory into long term memory.

One does not require to be multitasking to have higher productivity. Focusing on one job and becoming good at it with more information and practice anyway increases the productivity.

Brain to brain interaction is possible in near future. This may change the whole idea of teaching and learning and; the structure of the classroom.

Eighthly, Twin sisters with connected heads

In 2006 in Canada, two girls with connected heads were born. They are craniopagus twins. They are joined in such a way by their heads that separating them may kill or paralyze one or both of them. One is named Krista Hogan and the other is named Tatiana Hogan. It was observed that when one girl is watching TV and the other is not at an angle from where she can watch TV, still the other girl is able to laugh and giggle at the scenes. Later on the incidence was described as follows: Their doctor, after studying one of hundreds of photo of their brain imaging, said that the thalamus of one girl is connected to the thalamus of another girl through what the doctor names as 'thalamus bridge'. Their doctor was Douglass Cochrane, a neurosurgeon of British Columbia children's hospital. Here is one image of the twin: The kids are such that they can talk to each other in the brains and start laughing

at each other. Their thoughts are accessible to each other and they can see from each others' eyes. Their personality is quite different from each other. Krista is bossy and outgoing. Tatiana is calm and likes telling jokes .

The conclusion that I draw from this study is that, one, the definition of qualia as inaccessible states of a human being is problematic. Two, if in future we are able to construct the thalamus bridge then qualia would also be functionally reducible in the same way as the intentional states. It shows that Kim's view on qualia is shunned by the present studies. Therefore, theoretically at least quale is also functionalisable. As far as qualia epiphenomenalism is concerned, it can be argued that there is no positive proof of causation to account for even physical states and events (Hume, 1738). Therefore quale is on equal footing with all the other types of events, no matter they are physical, social, mental or of any other sort.

We can't even imagine how the class-rooms and learning and teaching may transform with the functionalisability of qualia. And the time is not very far when brain to brain communication will be possible without any other medium in between.

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