

THE EFFECT OF CULTURE ON THE DEVELOPING BRAIN

Eva Gyarmathy

Senior Researcher

Institute of Cognitive Neuroscience and Psychology

of the Hungarian Academy of Sciences

gyarmathy.eva@gmail.com

Abstract

In the past few decades, life has been almost totally transformed due to the immense and ground-breaking technological progress. A significant change in culture brings about significant changes in the functioning of the human nervous system, and thus in human thinking. External stimuli heavily affect the development of abilities throughout an individual's life. Many of the neurologically based achievement difficulties are the result of the cultural changes, thus we have to follow the changing in the education to lessen the rate of special need children. Beyond the assistive technology ancient methods for the neurological harmonisation can support the development of the special need children of the digital age.

Keywords: cultural changes, achievement difficulties, special need

The digital age

The mode of information processing characteristic of the human brain is affected by the tools that in everyday life play the most significant role in communication and the acquisition of knowledge.

With the rise and spread of informational technology, more and more people voice their concerns about the next generation. Since all information is easily accessible and ready at hand, there is no need at all for memorising anything. Memory skills are deteriorating at a rate never seen before.

This is no longer the future. Today's children grow up with all information accessible to them, and there is thus no need to burden their minds with actual pieces of knowledge. The change in abilities does not only affect children. Everyone living in the digital age changes according to the culture.

Even the most literate individual that rejects and despises the digital world cannot escape the effects. With a push of a button, we are immersed in an immense amount of knowledge coming through the television, computers and mobile phones. We no longer need to and no longer can do mental calculations or remember telephone numbers. Printers and scanners will save us a lot of handwriting, note taking and copying, at the cost of the deterioration of our handwriting skills (Gyarmathy, 2012).

The literal age

Even the beginnings of the now declining literacy itself was unacceptable for some.¹ Plato describes the objections of Socrates to literacy². With writing, says Socrates, memory skills will decline, since people will not use their memory, because there is no need for it. Knowledge in the head is alive, it belongs to man himself, while written words are merely reminders of knowledge. Writing leads to superficial knowledge – claimed Socrates (Goody, Watt, 1968).

Socrates saw correctly that literacy was going to have a great effect on human thinking, and not necessarily a beneficial effect at that. Change, however, cannot be avoided. We must be aware of the consequences to enjoy the benefits of new tools while saving all of what will still be necessary for humanity in the future of that which is coming to be outdated.

Our memory has definitely changed with literacy. Delivering long myths, sagas or messages required a much more holistic, comprehensive functioning of memory. With the arrival of writing, this burden was greatly reduced and our holistic kind of memory skills have become weaker.

Luckily, however, we have not incurred losses only. With literacy, we gained serial, step-by-step thinking. The analytical, logical mode of information processing has developed and took over the leading role in human thinking.

Writing freed us from the present. Information is no longer tied in time to its creator. Reading and writing is more abstract than speech and understanding speech, and consequently, literacy played a substantial role in the development of analytical, logical, abstract thinking. The logical process is basically literal (Goody, Watt, 1968).

Through writing, literate people switched to a much more analytical and linear kind of thinking compared to the era of purely spoken language (Hajnal,

¹ I would like to thank dr Károly Varasdi for bringing this issue to my attention.

² In both Phaedrus and in the Seventh Letter

1982). Reading and writing require sequential and methodical thinking. These enable, and what is more, require a much more analytical thinking than spoken language.

In the digital age, the mode of information processing is once again changing. Alongside the previous analytical and sequential mode of processing, a holistic and spatial-visual mode of processing is receiving increasingly greater weight. Technological tools have made it possible for information transfer to be based on spatial-visual stimuli which enable a quick transfer of a huge amount of information. This is what our brain is also adapting to (Gyarmathy, 2012).

The change in the human brain

Studies have shown that even the nervous system of elderly people changes significantly. Those who regularly browse the Internet have a better short-term memory than those who do not use this technology. Greater activity is also detected in regions connected to decision-making and problem-solving. The nervous system will function accordingly (Small, Vorgan, 2008).

Marc Prensky (2001) called those individuals digital natives who were born in the era when digital technology has already become part of households. He referred to people who were socialized before this age, digital immigrants. The new culture has a strong function-changing effect on the nervous system of the latter, too, but the basic wiring of their brain happened in the era requiring linear, sequential thinking.

Digital natives can easily process changing information and are much quicker at making decisions than digital immigrants, but they are weaker in the area of methodical, precise and systematic thinking.

The natural need for exercise, activities and active pursuit of stimuli is satisfied with passive experience. In a virtual world, it is virtual abilities that will develop (Gyarmathy, 2012).

Digital natives and special educational need

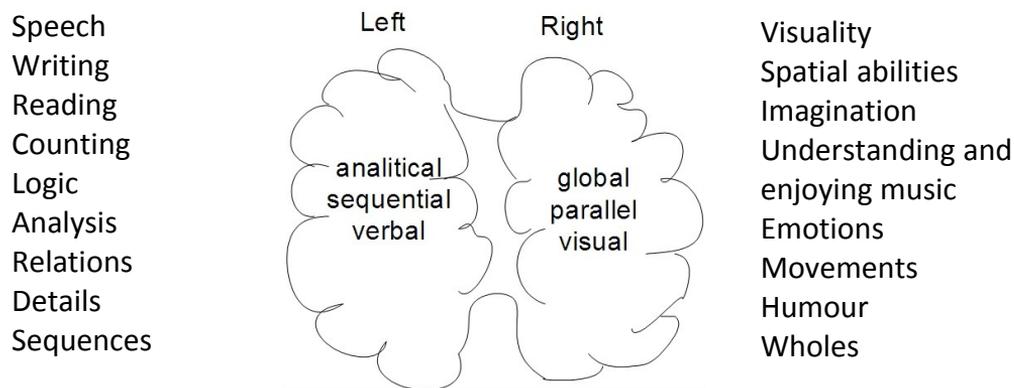
Humanity is prompted by laziness to devise new tools. It created an efficient writing system so that people do not need to remember everything. Electronic tools further alleviated this kind of intellectual burden.

Literacy strengthened logical-analytical thinking. In the digital age, visual processing and a holistic, comprehensive and intuitive approach is becoming stronger. The direction of the change is basically the exact opposite of what happened when alphabetic writing came into use. The detail-oriented, analytical thinking is slipping into background.

Step-by-step processing is associated with the left hemisphere. This hemisphere handles details and relations. It is responsible for functions for which sequentiality is essential: Speech, writing, reading, counting and logic all require correctly joining up parts to arrive at the whole.

The right hemisphere handles information holistically, simultaneously. It is thus associated with, for instance, spatial-visual abilities, understanding music, imagination and humour.

Figure 1: The two types of thinking associated with the two hemispheres



Digital natives develop a more balanced dominance. Processing the huge amount of visual information strengthens the right hemisphere. The former clean-cut left hemisphere dominance appears to be diminishing. This is shown by the weaker results in the tests of seriality (Gyarmathy, Kucsák, 2012).

In school education, however, this change is not taken into consideration, and learners are confronted with such requirements as if no change had taken place. Soon professionals will realize that because of their different abilities, all digital natives have to some extent special educational needs. This means that what is needed is a different, appropriate way of teaching instead of labels.

Amidst all these changes, the children who truly constitute a minority because of significant differences in their abilities and truly have special educational needs, are put in an even more difficult position, even though many of them would be capable of outstanding achievements.

An effective cognitive cultural diet

Human culture has areas from the beginning that secure the activities needed for the basic sustaining of the brain. There is no need to invent new ones.

Movements: The simplest and most efficient therapy of neurologically-based disorders is the stimulation of the balance system. Juggling, for example, has formed part of human life for ages. Juggling three balls is not a circus act, but neurological harmonization. It harmonizes the two brain hemispheres as well as all sports and dance that requires alternate use of the limbs.

Art: Art is the process when the inner feelings and imagination turn to outer forms. It starts in the chaotic right hemisphere and takes shape, sequence of words, sounds, movements.

Strategic games: The step-by-step information processing is supported by the visual image of the board, and the movements of the pieces. The left hemisphere is working hard, but with the contribution of the right one.

These universal, cross-cultural activities that secure the development and effectiveness of the human brain have formed the main activities of every former great school and education system. Movements, art and strategic games are the basic cultural activities.

Summary

Uniform education identifies specialities as disorders, when in fact these merely mean differently wired brains. More and more learners are unable to meet the requirements and the number of individuals identified with special educational need is constantly growing.

Technology, audio-visual developmental and assistive applications, and all the miracles of the 20th and 21st centuries can be used in the provision of children with and without special need, but unfailing and unquestionable bases are still the tools of an ancient culture: movements, art, strategic games.

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