HARMASH B. K., *Cand. Sc. (Tech.)., Ass. Prof.;*
KATKOVNIKOVA L.A., *Cand. Sc. (Tech.)., Ass. Prof.;*
HRYHORIEVA Y. S., *Ass.*
Ukrainian State University of Railway Transport
Kharkiv, Ukraine

CHANGES IN HUMAN CAPACITY TO WORK WHEN DEVELOPING AND SHAPING THINKING UNDER THE INFLUENCE OF DIGITALIZATION

Digital dementia is not a joke, but a diagnosis. The term "digital dementia" comes from South Korea, the first country to digitize. Today 83.8% of South Koreans have access to the Internet, 73 % of Koreans have a smartphone (in the United States, 56.4 %).

In 2007, experts began to note that more and more teenagers (members of the digital generation) were suffering from memory loss, attention deficit disorder, cognitive impairment, depression and low self-control. The study showed that these patients' brains show changes similar to those that appear after a brain injury or in the early stages of dementia, a dementia that usually develops in old age.

The mass craze for smartphones and other digital gadgets is an inevitable consequence of the technological revolution sweeping all countries. Smartphones are rapidly conquering the world, or rather, practically conquering it. The Wall Street Journal predicts that in 2017, 84.8 % of the population of South Korea (80% in Germany, Japan and the United States) will own a smartphone.

Although this process requires time and more extensive statistics, the general contours of the picture are already visible thanks to the efforts of renowned experts who summarize scientific data and try to convey their understandable interpretation to society.

Manufacturers of digital devices demand unequivocal proof of the possible dangers of gadgets, and they themselves order studies to show that smartphones, tablets, and the Internet only benefit children.

Real scientists are always careful in their statements and assessments, it is an integral part of their mentality. For example, experts in the field – Manfred Spitzer and Susan Greenfield. They, too, demonstrate in their books a correctness of judgment, a debatability of this or that aspect of the problem. Undoubtedly, we know a great deal about how the brain develops and works, how our bodies function. But not everything, and complete knowledge is hardly achievable.

And judging by the books and articles we have read, there is more than enough evidence of the potential dangers of digital technology for the growing brain. So it's a good idea to listen to the opinion of intelligent and experienced people.

Let's take note that none of the above authors has nothing against new digital technologies as such: yes, they provide convenience, speed up and facilitate many activities. And all the above experts certainly use the Internet, cell phones and other devices that help in their work. It's just that new technology has a downside: it's dangerous to childhood and adolescence, and that needs to be taken into account.

The steam engine, the steamboat, the airplane, the automobile, too, were ingenious inventions of humanity that changed its environment, although they were hotly debated in their day. But we do not put an infant behind the wheel, we do not give him the steering wheel, but we wait until he grows up and forms into an adult. Knowing all of this, the question arises about the advisability of not having time to separate the baby from the breast, give him in his hands a tablet, and over time to put displays in kindergartens and on every school desk.

The main factor in this whole story is time. It is frightening to think that a seven-year-old in Europe has spent more than a year (24 hours a day) in front of a screen, and an 18-year-old in Europe has spent more than four years! These shocking figures begin Aric Siegman's report to the European Parliament. Today, the average Western teenager spends about eight hours a day "communicating" with screens. This time is stolen from life because it is wasted. It is not spent talking to parents, reading books and music, playing sports or games, none of the things that a child's developing brain requires.

The opponents argue that the time is different now. That is why children are different and their brains are different. Yes, time is different, but the brain is the same as it was a thousand years ago – 100 billion neurons, each connected to ten thousand of their own kind. That 2 % of our body (by mass) still consumes more than 20 % of our energy. And until they put chips in our heads instead of brains, we carry 1.3 to 1.4 kilograms of gray and white matter, shaped like the nucleus of a walnut. It is this perfect organ, which stores the memory of all the events of our life, our skills and our talent, that determines the essence of a unique personality.

Neurons communicate with each other by exchanging electrical signals, each of which lasts one thousandth of a second. "Seeing" the dynamic picture of the brain at any given moment is still impossible, since modern brain scanning technology gives pictures with a resolution of seconds, the most advanced devices give pictures with a resolution of tenths of a second. "So brain scans are like Victorian photographs. They show static houses, but they exclude any moving objects – people,

animals that moved too fast for the camera's shutter speed. The houses are beautiful, but they don't give a comprehensive picture – the big picture," writes Susan Greenfield. And yet we can keep track of the changes that occur in the brain over time. What's more, there is now a technique that allows us to observe the activity of a single neuron by means of electrodes placed in the brain.

Research gives us insight into how our main organ develops and works. The stages of brain maturation and development have been honed over hundreds of thousands of years, a well-established system that no one has abolished. No amount of digital and cellular technology can change the time of carrying a human fetus - nine months is the norm. It is exactly the same with the brain: it has to mature, grow fourfold, build neural connections, strengthen synapses, acquire a "shell for wires" so that the signal in the brain passes quickly and without loss. All this gigantic work happens until the age of twenty. This does not mean that the brain does not develop further. But after the age of 20 – 25 it does it more slowly, more precisely, building up in detail the foundation that was laid by the age of 20.

One of the unique properties of the brain is plasticity, or the ability to adapt to the environment in which it resides, that is, to learning. For the first time this amazing property of the brain was mentioned by philosopher Alexander Bain in 1872. And twenty-two years later the great Spanish anatomist Santiago Ramon y Cajal, who became the founder of modern neurobiology, introduced the term "plasticity. Thanks to this property, the brain builds itself by responding to signals from the outside world. Every event, every human action, i.e. any human experience, generates processes in our main organ that have to remember this experience, evaluate it, and produce the evolutionarily correct human reaction. This is how the environment and our actions shape the brain. Science has accumulated many amazing studies illustrating the fantastic plasticity of the brain.

We shape our own brains, and thus our own future. All of our actions, complex problem solving and deep thinking all leave traces in our brains.

The inability to get out of the Internet and social networks, to break away from computer games catastrophically reduces sleep time in adolescents and leads to its serious disorders. What kind of brain development and learning is it, if you have a headache in the morning, fatigue overcomes, although the day is just beginning, and no schoolwork does not go well.

But how can sitting on the Internet and social networks change the brain? First, monotonous pastime drastically limits the amount of external stimuli, that is, food for the brain. It doesn't get enough experience to develop the crucial areas responsible for empathy, self-control, decision-making, etc. What does not work dies out. A person

who stops walking has atrophied leg muscles. A person who doesn't train his memory with any kind of memorization: it's like there's no need, everything is in the smartphone and the navigator. Hence, memory problems inevitably arise. The brain can not only develop, but also degenerate, its living tissues can atrophy. An example of this would be digital dementia.

How all this will affect the formation of a person's future ability to work – time will tell. After all, with systematic work, a person has the aspiration, the ability to perform the necessary tasks quickly and efficiently. Digital dementia can be a serious obstacle in the future for employers and business leaders.

***ДОЦЕНКО С.І.**, д.т.н., доцент*
Український державний університет залізничного транспорту
***ДОЦЕНКО С.О.**, д.т.н., проф..*
Харківський національний педагогічний університет ім. Г. С. Сковороди
Харків, Україна

ФІЛОСОФСЬКА КАТЕГОРІЯ «ЦІЛЕ»: ВИЗНАЧЕННЯ ЇЇ РОЛІ У РОЗВИТКУ ТЕОРЕТИЧНИХ ОСНОВ КЛАСИЧНОЇ КІБЕРНЕТИКИ

Теоретичні основи класичної кібернетики були сформовані у тридцятих та сорокових роках минулого століття. Першою роботою слід вважати публікацію академіка П.К. Анохіна з теорії функціональних систем, яка відноситься до фізіологічної кібернетики (1935 рік) [1]. Першою роботою з технічної кібернетики слід вважати публікацію Н. Вінером його монографії «Кібернетика» (1948 рік) [2].

Ці роботи заклали основи кібернетики як науки про закони управляння та зв’язок в живих організмах і машинах [2] і нажаль, одночасно породили проблему, яка не вирішена до цього часу. Ця проблема полягає у взаємному невизнанні представниками відповідних наукових шкіл результатів, які отримані представниками іншої наукової школи.

Це протистояння, в кінцевому рахунку, призвело до відмови від самого поняття «кібернетика» в царині технічної кібернетики і загально визнаним на цей час є поняття «інформатика».

З іншого боку, представники фізіологічної кібернетики критично відносяться до моделей штучного нейрона, а також штучних нейронних мереж, які є основою теорії штучного інтелекту.