PIONEER
ACADEMIC PUBLISHING LIMITED

Journal of Progress in Engineering and Physical Science
ISSN 2709-4006
www.pioneerpublisher.com/jpeps
Volume 2 Number 1 March 2023

Nanotechnology to Transform the Current Educational System

Dalvinder Sngh Grewal[1]

[1] Desh Bhagat University
Correspondence: Dalvinder Sngh Grewal, Desh Bhagat University.

doi:10.56397/JPEPS.2023.03.03

Abstract

Change is the law of nature. Our education system has not changed over the ages and there is certainly a need to change this system. Nanotechnology may play a Steller role in the change of this system where the existing system will be taken over by a nanochip placed into the mind and then operated through BrainGate technology. All the knowledge will be in the form of nanochips and available to the responder all the time, he will not need to go to any educational institution since it is already procured. Work is already in developing nanochips that can be fitted into the brain and for getting the knowledge into the human mind. Even though could be converted into speakable /written form. This is the view presented in this paper.

Keywords: electronic chip, BrainGate, education, change

1. Introduction

It may no longer be necessary for moms to wake up their kids early in the morning, wash and dress them, and then wait for the school buses to arrive before boarding them. They won't have to wait for buses to pick up their kids in the afternoon. In fact, there won't even be a need for school buses. It is possible that parents won't have to spend a fortune on their kids' education. The educational facilities might not even be required. Teachers do not need to attend classes in order to spend a full day teaching. The school's administration won't have to handle all the hassles and spend millions on buildings and teachers.

In fact, this teaching industry may completely disappear. Nanochips are responsible for this transformation in the educational system. An integrated circuit known as a nanochip is so small that its individual components play significant functions. It is the miniaturisation of computer and electronic parts. Due to shorter distances between components and a shorter charge-carrier transit time, it operates faster and with less energy usage. (Nanochips, n.d.)

2. Providing Needed Knowledge Through Chip

How is the needed knowledge provided by this electronic chip system implemented? To make this a reality, each chip component needs to be built on an atomic size, which requires manipulating individual material atoms to generate the nanochip's smaller parts. (Techopedia, n.d.) The electron chips have the necessary knowledge. The smallest chips that can be put in the psyche are hips. The

manufacturing of a wide range of goods, from high performance to low power, is made possible by this technology, which offers astounding performance, power, density, and cost per transistor. These are extremely quick, energy-efficient devices. (Intel® 14 nm Technology, n.d.)

3. The NanoChips

The NanoChip System (Nanogen Inc.) integrates advanced microelectronics and molecular biology into a platform technology with broad commercial applications in the fields of genomic diagnostics and has attained 100% accuracy in the detection of SNPs by using electronically enhanced hybridization of complementary DNA strands. This innovation makes "multiplex" assays possible (the ability to run assays that determine the presence or absence of multiple genetic mutations at the same time and on the same chip).

The technology is being improved to enable DNA material to be amplified directly on the NanoChip cartridge, eliminating the need for a time-consuming preparation step and combining it into a single, streamlined detection process. The Mayo Clinic (Rochester, MN) has used the NanoChip System to look at SNPs in the gene encoding for the human enzyme thiopurine methyl transferase (TPMT). Thiopurine medications, which are used to treat leukaemia, Crohn's disease, dermatological conditions, and as immunosuppressants, have a different therapeutic response depending on TPMT polymorphisms. (Sandeep Kumar & Hanjoong Jo, 2021)

4. Functioning of Nanochips

Each binary bit of data is stored on a semiconductor memory chip in a memory cell, a small circuit made up of one-to-many transistors. On the chip's surface, the memory cells are arranged in rectangular arrays. One memory address is used to access several words, which are small groups of 1-bit memory cells. Memory is produced in words that are normally a power of two, with N commonly equal to 1, 2, 4, or 8 bits.

A binary number termed a memory address, which is put to the chip's address pins and indicates which word in the chip is to be accessed, is used to access data. There are 2M addresses on the chip, each containing a N bit word, if the memory address has M bits. As a result, each chip has N2M bits of data saved on it. (Braingate, n.d.) 2M, which is typically a power of two: 2, 4, 8, 16, 32, 64, 128, 256, and 512 and measured in kilobits, megabits, gigabits, or terabits, etc., provides the memory storage capacity for M number of address lines. The largest semiconductor memory chips as of 2014 only store a few gigabits of data, however more capacity memory is continually being developed. Memory can be organised into a greater word length and/or address space than what is provided by each integrated circuit by merging many chips—often but not always a power of two. (Jeff Stibel, 2017)

A memory chip may execute two basic operations: "read," in which the data contents of a memory word are read out (without causing any damage), and "write," in which data is written in a memory word, overwriting any data that has already been there. With each read or write operation, multiple words are accessible in some of the most recent memory chip types, such as DDR SDRAM, to boost data rate. Blocks of semiconductor memory are a common component of many integrated circuits used in computers and data processing, in addition to standalone memory chips. Cache memory, for instance, is a feature of computer microprocessor processors that stores instructions waiting to be executed. (Sandra V A & Devika Ramgopal, 2018)

5. Linking Chip Knowledge to the Mind by BrainGate

These chips would provide access to knowledge via the BrainGate technology. Thinking will be connected to the chip's data storage system, which the responder will then have access to. All of the knowledge from elementary school through graduate school can be stored on a nanochip. The brain can then be implanted with these nanochips. The mind will then be able to process this knowledge and provide any answers thanks to Brain Gate.

The Cyberkinetics platform technology underlies the BrainGate System, which senses, transmits, decodes, and uses the language of neurons. The BrainGate System operates on the premise that even when the arms, hands, and legs are not involved, the brain continues to function normally and generates signals. Signals are deciphered. The impulses are decoded and translated into cursor movements, giving the user a different Brain Gate channel to operate a computer with their thoughts, similar to how

people who can use their hands can use a mouse. (Sandra V A & Devika Ramgopal, 2018)

The BrainGateTM connects the brain and the limb. A sensor that is inserted into the motor cortex of the brain and a gadget that decodes brain impulses make up the BrainGateTM technology. BrainGateTM has the capacity to decode and re-connect such signals, enabling the limbs to move with just thought. Chips and nerve cells contact closely physically to enable for the transmission of information in one or both ways at brain-chip interfaces (BCHIs). Multi-site recording chips interfaced to cultured neurons or implanted in the brain to record or induce neuronal excitement serve as typical examples.

Neuroscientists have been discreetly developing the ground breaking BrainGate technology, which wirelessly connects the human mind to computers, for the past twenty years, and it has just made its global debut. Entrepreneurs like Elon Musk and Mark Zuckerberg are competing to find a way to implant computer chips in everyone's brains. The possibility of enormous strides forward is made possible by Musk and Zuckerberg's interest. (Braingate, n.d.)

Professor John Donoghue led a group of neuroscientists that developed a method for connecting a computer chip to the human mind and using it as a remote control for other devices. It was a cumbersome technology that required brain surgery and cables to be inserted into your skull in order for it to work, but it did. The system was known as BrainGate.

The Brown team decided to make BrainGate into a business because the opportunities were so incredible thrilling. They gathered a significant sum of money, advanced science and technology, and eventually went public with the company as Cyberkinetics. After a decade, Cyberkinetics was still promising, but it was losing money. BrainGate had begun pre-clinical testing, demonstrated effectiveness with patients, and demonstrated real signs of potential success.

6. Conclusion

The way we educate children and equip teachers must change in order to take advantage of these new prospects as technology progresses and creates new immersive and fantastical worlds. When technology advances more slowly than education, technology rather than educators define what constitutes a legitimate educational opportunity. This is largely what happened when "educational" apps were made available for use on adult-targeted smartphones and tablets. Researchers, educators, policymakers, and digital designers have the opportunity to set the direction today rather than getting sucked into the undertow since the metaverse infrastructure is still being built. We need innovative techniques to link the actual world with augmented and virtual reality in order to fully realise the potential of the metaverse as a 3D, global, interconnected, immersive, and real-time online realm.

The development of technology may lead to changes in the current educational system. The Brain Gate system will instruct the Nanochips, which are loaded with a wealth of necessary knowledge, to educate the youngster what is needed, sparing the expense of construction, instruction, and administration. The parents will save a tonne of money for their children's education, and the kids will avoid having to carry around a heavy book load.

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