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Information technology and medial education in the contemporary school

Abstract

This article concerns to the problems of introduction information technology and media education into contemporary school. Different factors connected with the introduction and arguments based on the cognitive sciences are presented.

Key words: medial education, computers aided education, information technology in education, cognitive theory

Conditions

Ubiquitous utilization of the Web and telecommunication systems is accompanied by social and cultural transformations. Mass media have dominated social communication. Significantly affecting our consciousness they have a bearing on millions of people in the process of their making decision. A possibility that media may manipulate the public is real. The more we are getting dependent on the information delivered by media, the sharper and more crucial the process is becoming.

The influence of media is constant. It occurs at work, at home, during the time of relaxation. It provides entertainment and fun, but most of all it provides information indispensable for an individual to function. Such a rapid expansion of information technology is due to the fact that computers have made it possible to widen up human mental capability. This quality results in growing importance of modern information technology in knowledge-oriented society.

The growth of cognitive research coinciding with massive computerization causes considerable changes in both educational practice and theory. The school, which introduces information technology, makes an individual even more susceptible to the influence of other media. The child, who is at home

associated with television, and also more and more often familiar with a computer, at school is made acquainted with technical aspects of computing. This way they create and strengthen specific behaviour which in consequence leads to psychological habits that are far from social expectation and acceptance. What also follows are drastic changes in a human brain structure which results from diverting the received information into different channels in the brain, e.g. visual. Therefore, massive introduction of computers to schools influences teaching and learning as well as the process of upbringing.

Information technology education versus media education

The massive occurrence of computers at schools has resulted in the growing conviction that this medium has unlimited capabilities as for making use of it in the process of education. This belief, which is rooted in the 60s, has been bringing about numerous speculations over what kind of consequences for education the modern technology might lead to. Excessive hopes concerning the computer were partly caused by advertising campaign lead by huge corporations making enormous profits from selling products connected with information technology. Also political elites, perceiving information technology as a perfect source of economic success and welfare, have contributed to this. The success achieved by Ireland and Finland stands a perfect example. Alas, it is neglected that the reason for the success was not merely introducing computers into schools, but what really mattered was making significant changes in the whole system of education, which were accompanying the transformations in these countries economy.

Perceiving education through globalization and creation of information-oriented society has drawn public attention to the necessity of teaching how to make good use of information technology and its tools. At the beginning of the process of introducing computers to schools it seemed that it would be just enough to improve significantly education effects in the short term.

Yet, the very first try to introduce computers to schools brought about ambiguous feelings. Instead of expected high level of education effects there was their deterioration, such as in England in the mid 80's. Demand for information technology specialists was rising in highly industrialized countries. Still relatively small increase in education results did not deter further computerization of schools.

After having made some minor changes concerned the quality and organization of the process of education, IT education on a massive scale was commenced. There was fast development of various forms of education, further education and self-education in IT, which objective was merely to teach how

to use computers and other accompanying equipment. In consequence school education became completely dominated by technical aspects of computing. The process was flourishing especially well as school education was dominated by verbal methods of conveying information, and learning facts by heart. Behavioral theory of teaching, which is the basis for this education, assumes developing sophisticated skills through acquiring simple components of these skills in sequence.

Focusing on teaching computing had a good point, though. It accelerated the process of popularization of IT in society as well as raised the interest in this technology in the whole educational system. This first stage, consisting in equipping schools with computers and other IT tools, was vital both to be given social consent to allocate considerable public funds for this purpose, and to convince teachers to make use of the new technology. As this undertaking paralleled political elites' outlooks, the technological model of computing education earned mass acceptance, while the issue of modernization of the process of education as well as education of teachers in teaching and upbringing was neglected.

Thus established model of IT education, having dominated schooling, diminished the importance of media education and the necessity of thorough changes in education. Therefore initially educational systems in different countries paid little attention to the new phenomena, such as:

- consequences of mass information, increase of electronic communication capabilities;
- changes taking place in the structure of society resulting from abandoning tradition and authorities, which is characteristic for a civilization oriented on oral and written communication;
- the appearance of electronic language in the domain of culture.

This unawareness of the new phenomena was connected with the parallel processes within education itself. From the one hand, the reluctance of a traditional school towards the new technologies, resulting from a lack of knowledge of the opportunities which the very technologies offer within the educational administration and teachers. On the other hand, limited funds for educational purposes. As introducing modern technologies called for reforming the process of education, e.g. new ways of evaluating school efficacy, it was easier and cheaper to limit information technology to the IT classroom, instead, thus creating a kind of ghetto isolated from the rest of the school.

Let's ponder some phenomena following mass exploitation of information technology in knowledge-oriented society. This very technology places a great emphasis on visualization, its dominating the written and spoken word. As a result, the dominating picture creates a new quality of behaviour and psycho-

logical habits, and also becomes a critical point in the process of processing data in the brain. For instance, receiving visual information emphasizes the particularity, as it is specific to a particular object or a perceived event, that is to what is visualized. The research on efficacy of the reception of information from the media, which was carried out by me in the end of the 80's, shows that the students with a lower IQ tended to use visual information more often, whereas the students whose IQ was high were rather indifferent to visual information, or even in some cases they found it interference. The results are consistent with human tendency towards realization of visual information, linking it with objects, attributing it to mimetic representations, and towards considering it as components of the craft of imitating. The problem of imitating will be dealt with later on, while discussing the relations between mime in culture and media education.

In verbal communication perception of its contents occurs at some specific time, which is consistent with the description of auditory phenomena. It can be assumed that verbal description consists of a collection of data in a sequence. Whereas during a visual presentation of an object there are series of simultaneous components which have a vital influence on information perception.

While synthesising a picture presented by a medium, the student has in front of his eyes the object as a whole. In the case of verbal communication it is quite different – during the process of synthesis the learner deals at best with shortening of memories (J a k o b s o n , 1989, p. 83). Therefore the time needed to acquire the contents of the picture is three to four times longer than the time for acquiring the contents conveyed verbally.

The process of shaping subconscious by the media takes place not only because of the accessibility of various issues, but also throughout consolidated social habits. Interacting with a computer the child learns how to make use of short commands, e.g. *open*, *close*, or icons (E c o , 1996). Young people losing interest in traditional ways of communication is the fact which is becoming more and more real. It is at least worth consideration that a 12th grader in the USA surfs the Internet for 4 hours on average. In accordance with that we should expect cultural changes in society, which consequently may influence functioning of individuals.

A massive supply of news, and visual information especially, creates a demand for life skills different from the hitherto existing ones. More important are becoming such skills as critical thinking, which enables verification of information obtained from electronic media, and the ability to distinguish facts from assessments or subjective opinions.

Education supported by information technology is in school practice far apart from developing the skills mentioned above. Its focusing on computing

itself causes increasing criticism of school and academic circles. The opponents emphasize that despite greater costs of technology and numerous expensive endeavours connected with organization, the expected results haven't been achieved so far. Information technology is getting obsolete extremely fast, so the costs of equipment and educational programmes are increasing. As a result, the rightness of taken actions is in doubt. According to American data, mere connection of all schools and libraries in the USA to the Internet will amount to 100 billion dollars within 5–10 years (Internet 1).

Because of the lack of precisely stated school objectives, apart from teaching computing itself, the influence of the information technology education on functioning of the contemporary school is apparently insignificant. This fact is also confirmed by research carried out in Poland (Siemieniicki, 2003). Technology getting obsolete so quickly is the reason why young learners have a little chance to make good use of all the information technology skills they will have acquired in the process of learning, when they finally get to the final class. It has become apparent that there is the necessity to restore the equilibrium in education, when the issue of the media would not be reduced to merely manual operating them. Postponing of the analyses of the cultural repercussions connected with introducing electronic media significantly changes the social context of education. We should remember that the child who has grown up in isolation from human society does not have the opportunity to develop the norm of intelligence related to human society, nor the speech or any higher emotions. Studies of children who were kept isolated from other people and their peers confirm that proper development is possible only within society, where culture created by humans determines common values, and forms the basis for a human to comprehend the surrounding world. Therefore any processing of information that occurs in human brain has some cultural association.

Cognitive science versus information technology and media education

Let us analyse the culture issue of media education in the context of neurobiology. Taking into consideration different concepts we can distinguish at least two especially important for the matter: one of them is constructivism, the other one is cognitive science. Constructivist concepts, which are being more and more often employed in education, have become important tools for educational research as well as for creating the contemporary vision of school. Researches carried out by Heinrich Pestalozzi, Jean Piaget, Lev S. Vygotsky and others drew our attention to the relationship between knowledge and culture, and human development. It is assumed that there are two aspects of culture influence on intellectual development of a human:

- thanks to culture we are able to create our own thoughts and thus our knowledge;
- culture we live within enables us to commence process of thinking.

Lev Vygotsky's idea that culture is the most essential ingredient of an individual's development has become a vital element of constructivism. It has played an important role in studies of human behaviour. Each child is developing within a socio-cultural background, hence their development influenced by learning, which in turn is backed by technology, will affect the ultimate effect of school functions. This leads us to a conclusion, which is very important for making information technology education ubiquitous. During this process the teacher concentrates mostly on assisting learning based on culture. This argument indicates the need to extend IT education to media education, which is a cultural field of technology.

Another conclusion is that education deprived of the function of spreading culture, or restricting it is becoming nothing more than a tool to consolidate the idea of a man-robot. In result it leads to the effect which is just exactly reverse to what is expected and desired in contemporary society.

Cognitive theory, which is still building up its perspective and particular approach to problems of contemporary humanism, consists of several, sometimes contradictory, views on cognitive processes. Without getting into detail we can distinguish two approaches within cognitive science. One, called "hard cognitivism", is oriented to a computer metaphor and an algorithmic model of human mind, the other one – "soft cognitivism", is focused on the body, and so called a materialized mind model (L a k o f f, 1987, pp. 339–340). Within both of these theories we can distinguish five common basic elements:

- human cognitive activity is presented in categories of representation (cognitive or intellectual),
- comprehension of human intellectual activity requires a computer, which serves not only as a tool for carrying out experimental research, but also as a model of mind functioning,
- conscious and rational processes characterised in categories of processing information are put first,
- a science dealing with cognitive processes is distinguishable from others because of its interdisciplinary character,
- it derives from Western European philosophy of cognition (G a r d n e r, 1989, pp. 18–19).

For a long time cognitive theory has placed less importance on the influence of emotional, affective, historical and cultural factors on cognitive activity. It resulted from the attempt to avoid too great complexity of the problem dealt with. As a result, "the hexagon of cognitive sciences" elaborated by Gardner

in 1978 (ordered by Alfred P. Sloan Foundation) and published in *State of the Art Report* included only following sciences: psychology, philosophy, linguistics, anthropology, neurology and artificial intelligence. However the dynamic development within cognitive science has led to new concepts. One of them refers to the gene theory called culture genetics or memetics mimetic. The term “meme” was first introduced to scientific language by a biologist R. Dawkins in 1966, who defined it as a basic unit of cultural transmission, i.e. imitation. It is worth quoting Darnet’s statement, who assumed that memes represent ideas, behaviour, style or habits which are spreading among people within a specific culture. A man has an unusual gift for emulating and duplicating memes. And thus memes create our cultural evolution. Being replicators memes have three aspects connected with:

- the information they convey and with the information carrier on which the information is saved,
- the effects which the information has on environment,
- the effects which influence the environment as a direct and indirect reason for multiplication of replicators.

What derives from the argument above are a few comments important for education making so ubiquitous use of information technology nowadays. First of all, school exclusively basing on education which prefers merely operating a computer creates a specific cultural information which leads to only one form of educational socio-type. This is the reason for growing scepticism towards the importance of the influence of information technology on education. Also researches carried out in Poland indicate that information technology classrooms have a minute influence on school functioning (S i e m i e n i e c k i, 2003). The current condition of IT education in schools resembles the one 20 years back, described by S. P a p e r t in 1980, where an IT classroom is a peculiar ghetto, separated from the rest of the school.

An important issue is to realize the fact that the technology applied in education is not culturally neutral. Alas, M.W. Appel as well as many other researchers are right assuming that technology causes in the person dealing with it a specific type of thinking which has a technical nature. The more emphasis is put on merely operating the computer, the more deprived of creative and ethical thinking is educational process. Research, carried out by me, indicates that placing emphasis on merely computer operating has resulted in pushing on the margins all the activity focused on developing in pupils critical thinking and moral acting. Leaving the current programme of IT education without any changes will create conditions for depriving social environment of its humanistic qualities.

The roughly presented relations between the technology introduced to school and cultural development indicate the necessity of verification of

school educational programmes, and introduction of media education to IT programme, as well as the necessity of focusing attention on interdisciplinary research of neighbouring areas of cognitive science and media.

It can be assumed that it is impossible to change the biased nature of hitherto existing IT education without the element of culture enclosed in media education. Another conclusion is the necessity to coordinate neurobiological research and media education in the field of culture.

Finally it is worth drawing our attention to the fact that the researches on the consequences of media influence on people have been hitherto carried out on a base of behavioural and psychoanalytic theories. Presently, this kind of approach is insufficient. Without a new cognitive-constructive perspective it will not be possible to create a coherent theory of communication, and employ its conclusions into educational practice. It is high time the "how-does-it-work" approach gave way to "why-does-it-work-this-way" approach.

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