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INFLUENCE OF THE INTERNET ON THE COGNITIVE ABILITIES OF MAN. PHENOMENOLOGICAL AND HERMENEUTICAL APPROACH

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ABSTRACT:

In this article, the authors study the influence of the Internet on human cognitive abilities using a phenomenological and hermeneutical approach. They characterize the Internet as an electronic or technological form of media communication facilitating nearly instantaneous and active dissemination of information, in particular image-based information. The authors study the Internet's influence on the cognitive abilities of humans using a definition of the Internet as multilaterally connected information networks. Applying the theoretical approach, they reach the conclusion that newly formulated thinking strategies feature a network-like character to the detriment of the ability to observe, remember and other higher levels of thinking. The empirical approach is based on neurological and sociological studies which reveal the fact that new ways or strategies of thinking are being fixed in the brain, thereby driving long-term and permanent changes in human thinking. In such a case, the inability to concentrate on one idea for an extended period of time in order to reach a deeper state of contemplation proves to be at risk. In connection to this, we may encounter, as the authors believe, symptoms of knowledge deficiency resulting from a loss of interest in linear, chronological thinking. The authors claim that knowing these risks should lead to a more careful and more critical approach to the Internet, or even Internet communication, which may partially mitigate its negative influence.

KEY WORDS:

phenomenology, hermeneutics, the Internet, cognitive processes, linear and non-linear thinking, consideration, memory, level of thinking

Introduction

Much has been written about the influence of the Internet on people and their cognitive abilities, such as observation, contemplating, remembering and learning. A positive and optimistic approach to the Internet is prevalent in society in general as the Internet and all of its applications are simply trendy and ease communication and locating information while also offering various forms of entertainment. Finally, the global deployment of information technology in all levels of education serves to reinforce the general belief that new digital technologies increase the cognitive abilities of students. Scientists and academics, however, do not share such a unified opinion as exists in the society as a whole. M. Bauerlein, N. Carr, M. Spitzer and others, for instance, share the opinion that the Internet has a more negative impact on the development of human cognitive abilities.

In this study, we seek to highlight specific cognitive risks that accompany Internet communication. As opposed to previous authors who primarily used empirical methods, we applied phenomenology, which is best for capturing the essence or eidos of the Internet. Human cognitive changes must also be considered based on understanding of the essence or the fundamental structure of the Internet to which users must adapt. The phenomenological method was complemented by a hermeneutical method in order to avoid excessive "essentialism", as this method itself examines meanings in a network of positions and oppositions on a semantic field. We examine the Internet primarily through comparison with other media (writing, print and film) from which it differs. The distinctions made as to how the Internet differs from other media are then used to uncover its essence. An advantage offered by this approach, as opposed to empirical methods, is that items are not investigated "ex post" using consequences that may differ; rather the very nature of the Internet is examined. Empirical research usually confirms what is given by the actual structure of the Internet. On the other hand, the complementarity of the approaches here is important, as without empirical research, any considerations of the influence of the Internet would remain exclusively within a theoretical level ("in potentia").

The objective of the article is to define the essence of the Internet and its influence on the cognitive abilities of man using a phenomenological-hermeneutical approach. Theoretical investigation of the influence of the Internet is supplemented in a complementary manner by empirical researches conducted by authors such as Spitzer, Carr and Bauerlein. Given recognition of the risks posed by the Internet, a specific "counterweight" to the Internet will be identified secondarily in order to limit its negative effects on the cognitive abilities of humans.

Towards a Phenomenological Definition of the Essence of the Internet

The phenomenological definition of the essence or the eidos of such a complex phenomenon as the Internet is by no means a simple task. Classic phenomenology seeks to use the eidetic reduction of a mental item in order to identify the essential invariant, or the eidos of the item.[1] It is true that we already have an idea about the Internet and we do think about it, but it does exceed us in every direction, horizontally, as well as vertically. Horizontally, the Internet is a worldwide, global network, while vertically it contains different levels as well as technological tools, information and human communication with cultural symbols. The Internet is not like a book, which can be observed physically and is relatively easy to mentally process in an eidetic manner and, thereby, to identify the essential invariant (the essence of a book is that it has a material, tangible format and its content is a linearly-configured structure of characters). Despite this, we do think that it is possible to identify the eidos of the Internet, a kind of basic matrix on which everything is constructed and which has a structural influence on our cognitive abilities and on culture as a whole.

1 BLECHA, I. et al.: *Filosofický slovník*. Olomouc : Nakladatelství Olomouc, 1998, p. 120.

Many authors have attempted to capture the essence or the fundamental character of the Internet. L. Ropolyi is one of them. Ropolyi understands the Internet as a complex, multi-layered system in which four levels are identified: the technological, communication, cultural and organismic levels.[2] Ropolyi says – with respect to the first level – that the Internet is a system of computers that are able to rapidly and securely access information inside the worldwide network. As a technological tool, the Internet is connected to other technological tools that support different human and social needs, ranging from shopping to international financial transactions. Engineers, IT specialists, programmers, and even research and technology philosophers investigate this level. Ropolyi understands the next level of the Internet as space for different types of communication. He says that the Internet represents an active agent within such communication as it only facilitates, prompts and enables specific types and forms of communication. A range of content, including text, audio and image can be communicated over long distances thanks to the Internet. The second level is investigated by experts in the field of communication studies or is an area falling under the philosophy of communication. The third level, according to Ropolyi, is cultural, which must be understood in the widest possible sense and which contains different human ambitions, intentions, values, plans and products. The Internet as a universal medium may contain all the same cultural values and activities as the real world. It also creates a new cultural world in which self-realisation can be accomplished in many different ways that would simply be impossible in the real world. Psychology, ethics, cultural philosophy, anthropology, social theory and social philosophy focus on the cultural aspect of the Internet. Finally, according to Ropolyi, the Internet is an independent organism that can be examined separately from the technology inside its structure. This globally distributed organism develops in the same manner as any other evolutionary system. People themselves, along with their thoughts, actions and ambitions are a part of this organism. System theory and meta-philosophy investigate the Internet as an organism.

Ropolyi summarises the characteristics of the Internet by stating that the Internet is a self-developing and complex technological tool that plays a central role in modern communication processes while also functioning as a cultural medium able to store, represent and protect basic human values.[3]

Ropolyi's characterisation of the Internet is relatively complex and his definition of a hierarchy or pyramid structure (technology – communication – culture) adds a dynamic, evolutionary approach that represents particularly a meta-philosophical view of the Internet. It is exceedingly difficult to identify the essential invariant of the Internet from this understanding of the Internet helpful for defining the particular influence of the Internet on the cognitive abilities of man.

D. Clark also provides a similar, hierarchical configuration of the system.[4] It is true that Clark primarily characterises cyberspace, but this characterisation can also be applied to the Internet in a broader sense, just like Ropolyi (communication, cultural and meta-philosophical level of the Internet). According to Clark, there are four levels of cyberspace: physical, logical, informational and human.

The physical level of cyberspace according to Clark is comprised of spatially interlinked physical devices. These physical devices include computers, servers, sensors, transmitters, networks and communication channels. Communication between different physical devices flows through signals in cables and optical fibres or as waves in a wireless manner. The physical level access is easiest to grasp, especially for devices that are localisable.

According to Clark, cyberspace, as a logical level, is a series of platforms on which new construction possibilities develop and appear; these platforms themselves become a platform for new innovations. The lowest level of services is contained in the programmes implementing basic tasks, data transmission and data formatting. Applications, such as a database or website, are built on the basis of these services. Creative and active website content is the result of the combination of a database with a website. Services such as Facebook, which is a platform for other applications, can be found at the top of the web. Cyberspace is very elastic and recursive, building platforms for more and more platforms.

2 ROPOLYI, L.: *Philosophy of the Internet. A Discourse on the Nature of the Internet*. [online]. [2015-01-06]. Available at: <http://elte.prompt.hu/sites/default/files/tananyagok/philosophy_of_internet/book.pdf>.

3 ROPOLYI, L.: *Philosophy of the Internet. A Discourse on the Nature of the Internet*. [online]. [2015-01-06]. Available at: <http://elte.prompt.hu/sites/default/files/tananyagok/philosophy_of_internet/book.pdf>.

4 CLARK, D.: *Characterizing cyberspace: past, present and future*. [online]. [2015-01-06]. Available at: <http://web.mit.edu/ecir/pdf/clark-cyberspace.pdf>.

The creation, acquisition, storage and distribution of information are the primary experiences in cyberspace, according to Clark. Information on the Internet takes on different forms, such as music, videos and web pages. Information about information (meta-data) is also created or information that is used to search for other information is created, for instance by Google. The nature of the information available on the Internet changed when computers began working with collections of data and became capable of establishing additional connections with other computers. Data statically lived and lives on hard drives, USB keys and other media, but more and more data is created dynamically in networks, resulting in a loss of the spatial information localisation.

In Clark's opinion, people themselves are the highest level of cyberspace as they are more than simple passive users of the Internet; they rather actively share its content. Wikipedia exists because people contribute to Wikipedia. Twitter exists because people "tweet". Cyberspace is therefore intended for people, their communication and the creation of new content, which makes people the most important component thereof.

Clark's model of cyberspace (the Internet) is purely hierarchical and configured in a pyramid. The foundation of the pyramid is based on the technologies that connect to other levels – the logic, information and human levels. The deduction can be made from Clark's model and partially also from Ropolyi's model that the technological level is the foundation and decisive component for the other, higher levels of the Internet. Investigating the technology of the Internet can expose its eidos. The technologies that create the Internet are diverse, which is why focus must be dedicated to its basic structure from which its primary essence can be determined. In our opinion, this is based on the non-linear, networked connections of communication technologies. This represents the network that is mentioned in the actual name of the Internet, which, in our opinion, best captures the essence of new technologies that support non-linear communication. It is important to note the difference between our idea of a "network"[5] and actual network communication. Real Internet communication is beyond the limits of our imagination and we can only provide an approximation based on specific symbolic ideas and descriptions. The Internet network is three-dimensional and creates so called cyberspace, in which information is multilaterally interlinked. Like Teilhard de Chardin, we can say that this is a kind of "noosphere" in which we are completely submerged and in which communication takes place. One way or another, we can say that the term "network" best encompasses the eidos of this new media that the Internet represents.

Towards a Hermeneutic Definition of the Essence of the Internet

The phenomenological approach must be combined with the complementary hermeneutical approach as we would otherwise not be able to define what is different, what is new and what is decisive for determining the essence of the investigated communication technology without comparing the Internet to prior types of media. This approach fully corresponds with semiotic and linguistic rules that emphasize the relationship between characters within the cognition process. Meanings (ideas, including the idea of the essence) are generated according to such rules in a network of characters in different positions and oppositions. Therefore meaning itself is not substantive, but is created by the interactions between characters via comparison and mutual semantic deductions. Differences between characters in specific compositions denote different meanings. U. Eco says: "A cultural unit (meaning, idea – note by S. G.) cannot be isolated simply through a series of interpretants. It is defined by inserting it into a system of other cultural units that are its opposites and that limit the given unit. A cultural unit 'exists' and is recognisable given that its opposite exists. This is a relationship between different elements in the system of cultural units where the content that is transmitted onward is deduced from each of its elements."[6]

5 The "network" concept may evoke non-linear communication, which is two-dimensional, i.e. on a plane.
6 ECO, U.: *Teorie sémiotiky*. Praha : Argo, 2009, p. 93.

Using this approach, the essence of the Internet can be "deduced" through its relationship with prior media such as spoken word, writing, print and even TV. We can examine the individual media and then define what differentiates them from the Internet.

Spoken word represents a primary and privileged communication medium. We think, express ourselves, communicate and learn through speech. A particular and very important part of spoken communication is the dialogue involving the immediate[7] communication between two persons. This type of dialogue, compared to other types of communication, is the most intact, as the actual speech that is articulated is complemented by facial expressions, gestures, voice tone, emotions and physical proximity. Current Internet communication attempts to achieve this ideal level of intact "face-to-face" communication, examples of which include Skype or using mobile communication devices through which we can hear and see the other communicating person/s. However, a fundamental difference remains – Internet communication always relies on technology to facilitate the communication, which removes physical proximity to the other party that is present in face-to-face communication.

Writing breaks down the "wholeness" of spoken communication. This is given by the actual technological structure of letters and characters, in particular phonetically, which is a linear succession of visual characters. Reading and writing these characters supports perspective vision, thinking discipline in terms of the accuracy of our expression and differentiation of meanings, greater distance from things, and thus abstract thinking. Print media have a similar impact on cognitive abilities as they support the subject – object duality and mass phenomena. Communication on the Internet has seen a more fundamental shift in the configuration of these characters compared to writing and print. In writing and print media, characters are configured in a linear manner, while they are non-linear and networked on the Internet.[8]

The essence of film and television, at least at their beginnings, was in a linear configuration of images accompanied by sound. Passive reception can be added to the characteristics of this media. A fundamental difference comes to the forefront in comparison with the Internet in particular given the potential for active use, for instance in communicating or the creation of individual websites, etc., in addition to the networked connection of characters.

In the case of hermeneutic investigation of the Internet, we can state that we have confirmed the basic difference between the Internet and other media is based on the non-linear, i.e. networked configuration of characters (information). This difference is all the more obvious in relation to writing, print and partially to film and TV. The Internet is different from the media of speech in terms of facilitated communication, which is shared with other media, such as writing, print, film and TV. Another difference in terms of media such as film and TV can be seen in the ability of the Internet to support active perception of information. It does share an important character with film and TV in terms of communicated images. It shares the speed of communication, which has become nearly instantaneous, with other electronic media such as TV and the telephone.

Based on the different and shared characteristics of the Internet and other media, the Internet itself could be defined as a facilitating technological medium in which we can, through the multilaterally connected technological network, almost instantaneously and actively disseminate information, in particular iconic (visual) information.

Influence of the Internet on the Cognitive Abilities of Man

We attempted to define the eidos of media using a phenomenological – hermeneutic approach through which we want to deduce possible changes in the cognitive abilities of man. This approach is very general

7 Immediate communication is present in other media (writing, print and TV) as they are in an external relationship – in a physical sense – to persons and their bodies. Ultimately, speech is a medium as it is used to attempt to express something and to communicate. We realise that it is a medium when, as an example, an idea simply does not work out (a thought or a plan), which we can then easily express and communicate without the slightest of problems.
8 This aspect is identified within the phenomenological approach to defining the essence of the Internet, but the difference is made much clearer in this comparison.

and clear, but a major drawback is that it loses contact with reality. Empirical research, which specifically examines the impact of the Internet on the cognitive abilities of man, on the other hand, is in contact with reality, but its drawback is that it is partial, and non-all-encompassing, with different potential results. The combination of theoretical and practical study should help us partially compensate for these drawbacks. Empirical research should ultimately confirm what is implicitly marked in the actual structure of the media.

1. Theoretical approach. In order to use new technologies, we have to adapt our cognitive abilities to them. Our entire thinking strategy may change with extended use. J. Bystřický, for instance, says that "we also use different ways of thinking with the increased use of technologies, not in terms of changing the actual availability of such abilities; rather we fundamentally alter the strategy of their use".[9] This applies even more to the communication technologies with which we are in daily contact, such as the Internet. K. Leidlmair, referring to Heim, states that the use of computer technologies, and in particular the hypertext structure of the Internet, has radically changed our everyday thinking processes.[10] Contact with this communication technology will undoubtedly have a major influence on the cognitive abilities of man and this significant impact, as noted by J. Lohisse, will not be restricted to the current use of these media; rather it will have a growing influence and will simply be coded into our way of thinking.[11] Our way of thinking or our cognitive abilities as a whole will change based on the structural template of the Internet, which we have characterised as an instant and active network for communicating image information in particular. Such a way of thinking will serve to support what has become known as rhizomatic[12] thinking in philosophical and media discourses. This term was used by G. Deleuze and F. Guattari before the Internet age. The authors characterised it as follows: "A rhizome, as opposed to the tree, can connect any point to any other point and none of its characters is dependent on any other characters of the same nature; very different schemes of characters and conditions of non-characters also come into play."[13] U. Eco similarly evokes the concept of the rhizome and differentiates it from the previous line of thought by applying the tree concept ("arborescent" thinking). The image of the tree, in particular in the thinking of the Middle Ages (arbor porphyriana), represents a structure of hierarchical and logical thinking from the very essence of the being to its fringe manifestations.[14] Rhizomatic thinking, conversely, is non-systemic, incomplete, networked and without any beginning or end. The Internet directly supports "connecting the unconnected" and the breakdown of the "linear code" based on its own technological and network (rhizomatic) structure. U. Eco, for instance, states that the rhizome justifies and supports contradiction, because it produces non-linear loop processes. He even says that "thinking in the rhizome means taking a blind approach and simply following suppositions."[15] The Internet, which is characteristic for its hypertext or so called rhizomatic combinations of information, will not support abstract, linear and logical thinking,[16] which may represent a specific risk for modern society; itself often called the information or even knowledge-based society.

In addition to the networked character of the Internet, the dominance of images on the Internet may weaken the ability to think abstractly. We no longer have to imagine visual information ourselves, but their meaning is given to us within complex units. Images are then simply consumed, both in terms of the senses and mentally. G. Sartori even talks of a new anthropogenesis of man, and its transition from Homo sapiens to "Homo videns".[17] "Homo videns" is a man who rejects difficult rational approaches such as abstraction and logical argumentation, placing emphasis on images, emotions and entertainment. Postman reaches the opinion based on a comparison of the discussion in the 19th century regarding print media and in the 1980s with respect to television, where society shifts away from serious and rational thinking towards thinking in a more entertaining and superficially rational manner, which should continue to strengthen in the Internet age.[18] H. Pravdová confirms this in the context of modern media: "while the phenomenon of entertainment is one of the characteristic expressions of human culture, from its very beginning to the present day, individuals have never been exposed to so much pleasure as today."[19] An image, which is more information dense than plain text, according to Solík, has an influence on emotions and mood[20]; iconic communication therefore essentially implies entertainment.

A linear sense of time disintegrates as linear thinking disintegrates. Physical reference points that allow for time to be counted simply do not exist in communication on the Internet. Time spent on the Internet becomes simultaneous. Hypertext, non-linear connections of information without beginning or end, also supports the present nature of time. This perception and experience of time also has an impact on the perception of culture, which is no longer unconventional as it becomes current in a hypertext manner. P. Rankov says that: "Culture is only transferred horizontally, simultaneously and in a purely spatial manner in the network and meaning is lost during transfer over time. ... The transmission of information over time today is only an ancillary effect of network culture."[21] The increased emphasis on the present may also lead to a certain rejection of the past (and the future) and everything it entails, such as tradition, religion, the idea of nationality, etc.[22]

Communication on the Internet approaches the speed of light, which is why this type of communication has become almost instantaneous to the average percipient. The high speed of communication creates the feeling of a permanent present time, as it interrupts the "empty" period of time during which we wait for more information. This type of communication also dissolves our concept of a progression of time. On the other hand, the high speed of communication and geometric growth of data will cause problems in processing information over time. The accumulation of information, as T. H. Eriksen highlights, will lead to oversimplification, inaccuracies and information noise as well as to loss of the distinction between working hours and free time.[23]

Based on this knowledge, we can deduce that the Internet will support more non-linear and networked thinking, and, in turn, increase superficiality. Linear thinking allows us to progressively develop ideas, we can go into depth, but this approach is lost with non-linear thinking. The superficiality of thinking is supported by the increased speed of communication, the accumulation of information and shortening deadlines for real solutions. The dominance of images on the Internet and communication that takes place in the present will also support this trend as they will also repress the sense of a linear progression, consequential linear time and historical authenticity.[24]

2. Empirical approach. Research conducted by M. Spitzer, N. Carr and M. Bauerlein was used within the empirical approach. Spitzer and Carr conduct real empirical research focused on the neurological and cognitive changes, particularly in relation to pupils and students. Bauerlein researches the knowledge of students based on questionnaire research conducted in the USA involving subjects (social studies and history) connected to the past.

9 BYSTŘICKÝ, J. et al.: *Média, komunikace a kultura.* Plzeň : Aleš Čeněk, 2008, p. 19.
10 LEIDLMAIR, K.: *From the philosophy of technology to a theory of media.* In PHIL & TECH, 1999, Vol. 4, No. 3, p. 19. [online]. [2015-01-26]. Available at: <http://scholar.lib.vt.edu/ejournals/SPT/v4_n3html/LEIDLMAI.html>.
11 LOHISSE, J.: *Komunikační systémy. Socioantropologický pohled.* Praha : Karolinum, 2003, p. 176.
12 The term "rhizome" is from botany and represents a mass of roots.
13 DELEUZE, G., GUATTARI, F.: *Tisíc plošin.* Praha : Herrmann a synové, 2010, p. 30.
14 ECO, U.: *Od stromu k labyrintu. Historické studie o znaku a interpretaci.* Praha : Argo, 2012, p. 60.
15 ECO, U.: O*d stromu k labyrintu. Historické studie o znaku a interpretaci.* Praha : Argo, 2012, p. 60-61.
16 M. Spitzer states that digital natives obtain knowledge simply by surfing through superficial knowledge as opposed to thinking in a hermeneutic loop (from parts to the whole and vice versa): "Digital natives do not pass through this hermeneutic loop: they simply randomly click around and never return to a good source; they search horizontally (think superficially) and not vertically (in depth)." In Spitzer, M.: *Digitální demence. Jak připravujeme sami sebe a naše děti o rozum.* Brno : Host, 2014, p. 193.
17 SARTORI, G.: *Homo videns: La sociedad teledirigada*. [online]. [2014-06-17]. Available at: <http://ifdc6m.juj.infd.edu.ar/aula/archivos/repositorio/0/116/HOMO_VIDENS.pdf >.
18 POSTMAN, N.: *Ubavit se k smrti. Veřejná komunikace ve věku zábavy.* Praha : Mladá fronta, 2010, p. 66, p. 98.
19 PRAVDOVÁ, H.: *Determinanty kreovania mediálnej kultúry.* Trnava : FMK UCM, 2009, p. 294.
20 SOLÍK, M.: *Semiotic approach to analysing of advertising.* In European Journal of Science and Theology, 2014, Vol. 10, Suppl. 1, p. 213.
21 RANKOV, P.: *Informačná spoločnosť – perspektívy, problémy, paradoxy.* Levice : LCA Publisher Group, 2006, p. 26.
22 Changes occurring as a result of the influence of television, and – in particular – the Internet have infiltrated the culture as a whole, our general consciousness and thinking. We can illustrate this in a simple example where one would least expect the "dissolution" of linear code, i.e. the time line in a history textbook used in the 5th form at a primary school in Slovakia. The textbook is comprised of specific thematic areas that are richly illustrated but the entire time line, from prehistory to the present day is covered in a matter of two pages. After reading the entire textbook, the reader does not have a sense of change occurring over a long period of time, rather the only feeling is that of the present, where "expeditions" into the past primarily occur through images.
23 ERIKSEN, T. H.: *Tyranie okamžiku.* Brno : Doplněk, 2009, p. 64, p. 67. Compare to: GÁLIKOVÁ TOLNAIOVÁ, S.: Anthropological risks and the form that evil takes in the electronic media. In Jozek, M. (et al.): *Contemporary images of evil.* Krakow : Wydawnictwo Naukowe Universytetu Pedagogicznego, p. 40.
24 See: GÁLIK, S., MODRZEJEWSKI, A.: *Effects of the (electronic) media on cognitive processes.* In European Journal of Science and Theology, 2014, Vol. 10, Suppl. 1, p. 24.

M. Spitzer investigates the influence of digital technologies, including the Internet, on various areas of human cognition, such as attention span, memory, the ability to learn, emotions and the human body. On the basis of his research, Spitzer reaches the conclusion that the long-term use of digital media leads to an educational deficit and superficiality, which are accompanied by more permanent changes in the brain: "Anyone born in the mid-1990s or later has a hard time understanding how the world looked without computers and the Internet, without mobile phones and iPods, gaming consoles and digital television. People in this generation have grown up in a different environment; neuroplastic changes have defined the formation of their brains. ... digital media cause a learning deficit in young people ... The depth of intellectual work required for learning is replaced by digital superficiality."[25]

In terms of attention span, Spitzer warns that the use of multiple media at once, i.e. multitasking, as is now commonplace, leads to superficiality and inefficacy. The multitaskers are consistently shown to be slower than non-multitaskers in experiments.[26] The Internet can also be considered a multitasking medium as we can read, write, learn, entertain ourselves, gossip, etc., and switch between different incommensurable types of communication. This type of communication interferes with the linear progression of thought and will also weaken the attention span when using different communication technologies.

In relation to memory, Spitzer states that the preservation of information on computers, from a long-term perspective, leads to a loss of specialised knowledge needed by man for work with the computers. According to the author, this reduces the capacity for independent intellectual work, especially in the future, and the use of man's own memory as we learn by adding new knowledge to older knowledge.[27]

Spitzer also rejects the idea that we learn more using laptops and the Internet and critiques the government system of distributing laptops to schools. Spitzer says that "sufficient evidence is lacking to back the statement that modern information technology improves school education. Conversely, this leads to more superficial thinking, distracts and has other unwanted side effects, ranging from mere failures to child pornography and violence."[28] The use of computers (the Internet) in early childhood, according to Spitzer, can lead to attention and reading disorders in pre-school aged children. Social isolation also appears, in his opinion, at a school age.

Spitzer states that the manner in which we use our brains continues to change, as confirmed by neurobiology studies. Perception, thinking, living, reading and wanting; everything leaves traces behind in the brain. Modern neurobiology is able, according to Spitzer, to monitor changes in the brain that occur during cognitive processes and which are significantly affected by the media. Spitzer claims that the frequent and incorrect use of a computer and the Internet leads to an intellectual – and thus cognitive – deficit.[29]

N. Carr also says that our brain is flexible and is able to adapt to its environment, just like Spitzer. According to Carr, we think in conjunction with technologies (media), all of which is reflected in our brain in some manner. Carr does say that our reading and thinking habits have changed significantly since we began using the Internet. He claims that our ability to focus and to contemplate has been disrupted.[30] He uses a variety of neurology and psychology studies to repeatedly make the claim that communication on the Internet, which includes different types of media, primarily disrupts our attention spans. In essence, the brain acts as a juggler, constantly adapting to new stimuli offered by the Internet. Our thinking continues to get more superficial, despite Carr's claim that the depth of our thinking is directly tied to our ability to concentrate.[31] In other words, Internet network communication disrupts the linear (concentrated) approach to thinking, and, correspondingly, the ability to think at a deeper level.

25 SPITZER, M.: *Digitální demence. Jak připravujeme sami sebe a naše děti o rozum.* Brno : Host, 2014, p. 200.
26 SPITZER, M.: *Digitální demence. Jak připravujeme sami sebe a naše děti o rozum.* Brno : Host, 2014, p. 212.
27 SPITZER, M.: *Digitální demence. Jak připravujeme sami sebe a naše děti o rozum.* Brno : Host, 2014, p. 100.
28 SPITZER, M.: *Digitální demence. Jak připravujeme sami sebe a naše děti o rozum.* Brno : Host, 2014, p. 88.
29 SPITZER, M.: *Digitální demence. Jak připravujeme sami sebe a naše děti o rozum.* Brno : Host, 2014, p. 16-17.
30 CARR, N.: The Bookless Library. In BROCKMAN, J. (ed.): *Is the Internet Changing the Way you Think? The Net´s Impact on Our Minds and Future.* New York, London, Toronto, Sydney, New Delhi, Auckland : Harper Perennial, 2011, p. 2-3.
31 CARR, N.: *The Shallows. What the Internet is Doing to Our Brain.* New York, London : W. W. Norton & Company Luka, 2010, p. 42-48.

M. Bauerlein's research focuses on the different influences of the Internet on the cognitive abilities of man. The primary object of Bauerlein's interest is the level of secondary and university-level knowledge connected in some form of fashion with the past within subjects such as history, social studies, etc. His conclusion based on available questionnaire-based research is that such knowledge is rapidly disappearing. M. Bauerlein says: "Young people have never focused so intensively on themselves, have never been so close to each other and have never been so active in adolescent contact. Given that teenage symbols and songs, the latest gossip and games and communication between young people are all now unlimited in terms of time and space, they have penetrated into their bedrooms, cocooning them into a generation of isolation. Autonomy has its victims, the more they focus on themselves, the less they remember the past and imagine the future."[32] This loss of contemplation of the past (and the future) again is related to the very essence of Internet communication, which does not support a linear progression, including chronology, but is always in the present. D. Rushkoff shares a similar opinion, stating that the Internet pushes everything into the present. Communication on the Internet does not represent real time, rather it is a shift in time. This, in his opinion, explains why young students are unable to hold onto linear arguments and why narrative structures collapse even in the case of TV.[33]

Empirical research, a fraction of which has been identified, confirms that communication on the Internet weakens attention span, memory, depth of thinking and sense of linear time. All of this has a common denominator identified as the network in the theoretical part of this article, i.e. as networked, multilaterally connected information.

Conclusion

In this study we investigated the influence of the Internet on the cognitive abilities of man using a phenomenological-hermeneutic approach. The phenomenological approach seeks to identify the essence or eidos of the Internet, i.e. its essential invariant. We stated that the most basic invariant is the "network" or networked, multilaterally connected information. The phenomenological method was complemented by the hermeneutical method as the essence of the Internet is determined de facto by comparing the Internet to more traditional types of media. In this case, the difference in the networked configuration of characters becomes clearer and moves into the foreground. In addition, we added other elements that occur in previous kinds of media to the basic definition of the Internet, such as activity, facilitation, the speed of communication and iconography. Given this, we define the Internet as a facilitating technological medium in which we can, through multilaterally interlinked technological networks, communicate almost instantaneously and actively disseminate information, in particular information of an iconic (visual) nature. This defined essence or basic structure of the Internet served as the basis for considerations of its influence on the cognitive abilities of man. Both theoretical and practical approaches were applied. In the former, we conclude that the basic structure of the Internet will transpose into the cognitive abilities of man, which will adapt to these structures until they become relatively stable. These new strategies of thinking will have a non-linear property, to the detriment of attention spans, memory and the depth of thinking. The latter, empirical approach is based on neurological and sociological studies which show that such new thinking strategies are fixed in the brain and create long-term and stable changes in human thinking. The risk here is the inability to focus for an extended period of time on one thing and thereby to reach a depth of thought. Studies exposing the decrease in knowledge related to the past and the absolute loss of interest in linear, chronological thinking, such as processing information related to history, highlight additional risks.

These facts pose a tremendous risk, as noted, with respect to the cognitive development of the youngest generation in particular. Awareness of these risks may be the first step towards an improved approach to the Internet, as Spitzer notes: "education liberates – it liberates from a tremendous amount of temptations

32 BAUERLEIN, M.: *Najhlúpejšia generácia.* Bratislava : Vydavateľstvo Spolku slovenských spisovateľov, 2010, p. 19.
33 RUSHKOFF, D.: The Internet Makes Me Think in the Present Time. In BROCKMAN, J. (ed.): *Is the Internet Changing the Way you Think? The Net´s Impact on Our Minds and Future.* New York, London, Toronto, Sydney, New Delhi, Auckland : Harper Perennial, 2011, p. 178-179.

as someone who is educated is able to think critically about themselves and their surroundings and are no longer at the mercy of their surroundings, with the ability to immediately resolve challenges."[34] This is closely associated with a need for media education, which would teach children and young people in particular how to properly interact with the Internet and how to take advantage of all its positives in order to contribute to the cognitive and emotional and social development of man.[35]

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BIBLIOGRAPHY:

BAUERLEIN, M.: *Najhlúpejšia generácia.* Bratislava : Vydavateľstvo Spolku slovenských spisovateľov, 2010. 208 p. ISBN 978-80-8061-431-7.
BLECHA, I. et al.: *Filosofický slovník.* Olomouc : Nakladatelství Olomouc, 1998. 464 p. ISBN 80-7182-064-4.
BYSTŘICKÝ, J. et al.: *Média, komunikace a kultura.* Plzeň : Aleš Čeněk, 2008. 96 p. ISBN 978-80-7380-117-5.
CARR, N.: *The Shallows. What the Internet is Doing to Our Brain.* New York, London : W. W. Norton & Company Luka, 2010. 280 p. ISBN 978-0-393-07222-8.
CARR, N.: The Bookless Library. In BROCKMAN, J. (ed.): *Is the Internet Changing the Way you Think? The Net´s Impact on Our Minds and Future.* New York, London, Toronto, Sydney, New Delhi, Auckland : Harper Perennial, 2011. 408 p. ISBN 978-0-06-202044-4.
CLARK, D.: *Characterizing cyberspace: past, present and future* [online]. [2015-01-06]. Available at: <http://web.mit.edu/ecir/pdf/clark-cyberspace.pdf>.
DELEUZE, G., GUATTARI, F.: *Tisíc plošin.* Praha : Herrmann a synové, 2010. 590 p. ISBN 978-80-87054-25-3.
ECO, U.: *Teorie sémiotiky.* Praha : Argo, 2009. 448 p. ISBN 978-80-257-0157-7.
ECO, U.: *Od stromu k labyrintu. Historické studie o znaku a interpretaci.* Praha : Argo, 2012. 653 p. ISBN 978-80-257-0305-2.
ERIKSEN, T. H.: *Tyranie okamžiku.* Brno : Doplněk, 2009. 168 p. ISBN 978-80-7239-238-4.
GÁLIK, S., MODRZEJEWSKI, A.: *Effects of the (electronic) media on cognitive processes.* In European Journal of Science and Theology, 2014, Vol. 10, Suppl. 1, p. 17-28. ISSN 1841-0464.
GÁLIKOVÁ TOLNAIOVÁ, S.: Anthropological risks and the form that evil takes in the electronic media. In JOZEK, M. (et al.): *Contemporary images of evil.* Krakow : Wydawnictwo Naukowe Universytetu Pedagogicznego, p. 33-56. ISBN 978-83-7271-817-4.
LEIDLMAIR, K.: *From the philosophy of technology to a theory of media.* In PHIL & TECH, 1999, Vol. 4, No. 3, p. 13-21, [online]. [2015-01-26]. Available at: <http://scholar.lib.vt.edu/ejournals/SPT/v4_n3html/LEIDLMAI.html>.
LOHISSE, J.: *Komunikační systémy. Socioantropologický pohled.* Praha : Karolinum, 2003. 200 p. ISBN 80-246-0301-2.
PETRANOVÁ, D., BURIANOVÁ, Ľ.: *Potential of digital technologies use in the formal pre-primary education.* In European Journal of Science and Theology, 2014, Vol. 10, Suppl. 1, p. 263-276. ISSN 1841-0464.
POSTMAN, N.: *Ubavit se k smrti. Veřejná komunikace ve věku zábavy.* Praha : Mladá fronta, 2010. 208 p. ISBN 978-80-204-2206-4.
PRAVDOVÁ, H.: *Determinanty kreovania mediálnej kultúry.* Trnava : FMK UCM, 2009. 361 p. ISBN 978-80-8105-113-5.
RANKOV, P.: *Informačná spoločnosť – perspektívy, problémy, paradoxy.* Levice : LCA Publisher Group, 2006. 173 p. ISBN 80-89129-91-9.
ROPOLYI, L.: *Philosophy of the Internet. A Discourse on the Nature of the Internet.* [online]. [2015-01-06]. Available at: <http://elte.prompt.hu/sites/default/files/tananyagok/philosophy_of_internet/book.pdf>.
RUSHKOFF, D.: The Internet Makes Me Think in the Present Time. In BROCKMAN, J. (ed.): *Is the Internet Changing the Way you Think? The Net´s Impact on Our Minds and Future.* New York, London, Toronto, Sydney, New Delhi, Auckland : Harper Perennial, 2011. 408 p. ISBN 978-0-06-202044-4.
SARTORI, G.: *Homo videns: La sociedad teledirigada.* [online]. [2014-06-17]. Available at: <http://ifdc6m.juj.infd.edu.ar/aula/archivos/repositorio/0/116/HOMO_VIDENS.pdf>.
SOLÍK, M.: *Semiotic approach to analysing of advertising.* In European Journal of Science and Theology, 2014, Vol. 10, Suppl. 1, p. 207-217. ISSN 1841-0464.
SPITZER, M.: *Digitální demence. Jak připravujeme sami sebe a naše děti o rozum.* Brno : Host, 2014. 343 p. ISBN 978-80-7294-872-7.

34 SPITZER, M.: *Digitální demence. Jak připravujeme sami sebe a naše děti o rozum.* Brno : Host, 2014, p. 58.
35 PETRANOVÁ, D., BURIANOVÁ, Ľ.: *Potential of digital technologies use in the formal pre-primary education.* In European Journal of Science and Theology. 2014, Vol. 10, Suppl. 1, p. 267.