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Media education in the context of cyber-psychology: new perspectives for media and user research in contemporary media civilisation

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The aim of the article is to show new perspectives of research and development of media, digital and information competences in the context of knowledge and research in (cyber) psychology. It draws attention to the functions of media education in relation to civil society, the society of knowledge, and the society of communication democracy. In the modern media civilization, these competences, acquired through formal and informal education, are the basis for conscious functioning in many social roles (eg. citizen, consumer) and dealing with disinformation. The last part of the article is dedicated to shaping media competences in young children (2.5–7 years old), who should develop these skills under the care of an adult. The task of educational environments is the systematic implementation of home media education that facilitates the child's functioning in the environment of traditional and new media.

KEY WORDS: media literacy, cyber-psychology, media, digital and information competences

The dynamic development of digital media and their presence in all key spheres of life, including medical, psychotherapeutic and educational, requires a new approach to media, digital and information competences education (Ogonowska, 2013; 2016). The European Framework for Digital Competences for Citizens (DigComp) includes 21 competences which represent five key areas: information and data analysis; communication and collaboration; digital content creation; security; and problem solving.

Table 1. Key areas of digital competences and associated skills

Area	TYPES of competences
Information and data analysis	Searching, filtering, evaluating and managing data and information and digital content
Communication and collaboration	Interaction through digital technologies; information sharing and use; civic action through their use; collaboration, netiquette; digital identity management;
Digital content creation	Development of digital content; combining and processing of digital data, copyrights and licenses; programming;
Security	Protection of equipment, private data, privacy, health and wellbeing; environment
Problem solving	Solving technical problems; identifying needs and technological requirements; creative use of digital technologies; identifying gaps in digital competences

Developed on the basis of: https://ec.europa.eu/jrc/sites/jrcsh/files/DIGCOMP-FINAL-%20UPDATED%2002-06-2016.pdf [23.06.18].

Cyberpsychology, a new hybrid sub-discipline of psychology, which deals with a multifaceted study of complex relationships between man and technology provides new contexts for this kind of research (Ogonowska, 2018; Suler, 2016). Their effects are visible both in the behavioural sphere, as well as at the cognitive or neurobiological level (Spitzer, 2011).

Table 2. Examples of media impact

Type of media impact	Example phenomena
Social impact visible in behaviour	Disinhibition
Cognitive-behavioural impact	Disinformation in the media influences attitudes and behaviours as well as cognitive representations of phenomena
Neuro-biological impact	Stimulation or lack of stimulation activates or deactivates specific structures in the brain; affects the state of functional circuits responsible for specific cognitive and linguistic-communicative processes

Own elaboration

The distinguished effects can also be analysed on three main levels: macro, i.e. through the prism of phenomena characteristic for contemporary media civilization; mezo- in the context of processes and phenomena that define a specific group of media users, and micro- in relation to internal and external factors that determine the functioning of a specific individual.

Table 3. Three levels of analysis of the impact of media on people and related phenomena

Level of analysis	Example phenomena
Macro level	Globalisation, post-truth, fake news; hybrid media genres and formats; media as post-traditional education institutions
Mezo level	Information bubbles characteristic of contemporary discursive communities, apparent diversification of information sources; participation of groups in traditional and informal types of online and offline education
Micro level	Preferred media. Cognitive styles, forms of communication; influence of the closest environment on media, digital and informational competences of an individual.

Own elaboration

In the latter (idiographical) context, it is worth noting that in cyber-psychology we study human and media relations in various paradigms: medical (biological), philosophical (anthropological), cognitive, developmental, and their intersection. It is also impossible to avoid references to media studies, pedagogical or communicative research, and even speech therapy. The cognitive and developmental or neurobiological and educational approach is very popular, especially in Western and national research, mainly in relation to children and school adolescents (Cieszyńska-Rożek, 2014; Juszczyk-Rygałło, 2014; Rygałło, 2014).

The interfaces of various technologies not only mediate in social contacts, but virtual reality often becomes the only "social contact space", even in areas that were originally based on direct interaction: treatment, diagnosis, education or spiritual support (Pasikowska, 2013; Hare, 2013). E-services coexist with their traditional counterparts, but their effective use requires a dynamic development of the communication democracy society (Ogonowska, 2003) and minimizing the scale of digital exclusion (Batorski, 2009). Research conducted in 2014 shows that the number of people affected by this phenomenon in Poland reaches 12 million (Jasiewicz et al.; p. 2).

Technology is also becoming an integral part of the human body, and by supporting the biological functioning of the body it also monitors its functions, level of efficiency and psychophysiological parameters. On the basis of this information, external entities and institutions decide on the development, life, work and many institutional services related to the "cyborg-like" unit. The extremely negative effects of this influence have been portrayed in the British series "Black Mirror" (Wójcik, 2016), "Czarne lustro" in Polish.

The "organic", "bodily" context for digital media is also created by new media art "configured" with body art. These new medical and artistic applications change the social attitude towards new technologies and their presence in human life. The media, also in a very material sense, redefine our attitude to identity, autonomy or freedom (Suler, 2016, Commolly, 2016; Woźniak, 2016). An important dimension of new media competences in this context is also

the development of the habit of constant reflection on the place of media in our lives (an anthropocentric "positioning" of media).

At the same time, people's attitude towards the products of various technologies is changing: from purely objective and instrumental to subjective and humanistically characterised (Reeves, Nass, 2000). Technologies evoke an attitude of empathy, compassion and commitment in man, often in spite of a conscious declaration that they represent an order of things and not nature (the living world). The human mind seeks an equivalent of the human species in the humanoid designs, with which it is possible to establish not only factual and purposeful contact, but also an intellectual, moral and emotional covenant. The affective dimension becomes a new space of relations between man and technology; man and computer; man and interface (Errity, 2016).

These changes have a significant impact on the strategies and forms of education in the digital society. Friendly interfaces, artificial intelligence and humanoid robots are being used more and more often (Errity, 2016; Kirwan, 2016). The language of new media is becoming the basic code of social communication in media (and virtual) spaces and beyond.

A serious problem for personal development and a threat to the development of civil society is the growing number of disinformation in the traditional and new media, which are becoming the basis for political and consumer decisions.[1] Rapid access to various media content and tools for the production of various media objects is not accompanied by an increase in information, media and digital competences. Users at different levels understand and actively use this new media language.

The proposed educational solutions (formal education, informal education, lifelong learning) do not yet meet the desired objectives, as they are not adapted to the needs and capabilities (cognitive, developmental) of individual target groups. Potential beneficiaries

[1] https://eur-lex.europa.eu/legal-content/PL/TXT/PDF/?uri=CELEX:52018DC0236&from=EN [25.06.2018].

of such services are not systematically motivated to improve their media, information and digital competences; they often fail to see the link between that and the quality of their everyday life.

In addition, the need to improve these skills, knowledge and competences should underline the benefits, not necessity or orders, and this sphere should be associated with various challenges of everyday life and social roles played by a particular individual (family, civic, professional, etc.).

The availability of new technologies, i.e. the existence of an ICT society, does not mean that people are motivated and ready to use them. It is worth looking at these barriers, especially as many of them are mental in nature.

Self-exclusion from the process of assimilation of media, digital and informational knowledge and competences, in turn, translates into the development of a public sphere in which social cognition and individual cognitive representations of reality are based on post-truth and distorted information. Disinformation and lack of proper competences determine the phenomenon of digital exclusion, build a society of non-knowledge, far from the standards of mature democracy and attitudes of tolerance and humanism.

Meanwhile, post-modern media competences in the 21st century should be profiled for new technologies, which function both as an educational space and as a commonly available repository of knowledge and educational tools. The language of new media and network architecture maps human thinking about reality and the forms of action within the media civilisation. This applies especially to generations born in the world of new interactive, virtual, hypertextual and convergent media (Manovich, 2006; Jenkins, 2007).

Today's new media, which form the basis of e-services and mediatized social communication, are based not only on sight, hearing and touch separately, but refer to all the senses at the same time to enhance the impression of immersion, tele-presence; create the illusion of "being" and "acting" in a virtual space at the level of individual experience. Virtual and augmented reality, like other media based on friendly interfaces, change man's attitude towards the

technologies themselves, which in many situational contexts become "transparent". Without realizing their presence, we do not reflect on their real impact on the forms of information and strategies of interpersonal communication.

We learn to like the technologies we work with. We feel lost when a sudden breakdown deprives us of the ability to access resources or interact with others through social media. We appreciate the fact that technological solutions are perfectly tailored to our needs, therefore we are more and more willing to treat them as an extension of our body and our social or cognitive capabilities.

We also trust the various forms of cyborgization of our bodies, the essence of which, as mentioned earlier, is that technology not only supports and monitors its processes (such as cardioverter-defibrillator, ICD), but also enables our geo-location (such as "subcutaneous" chips). We are gradually, but on an increasing scale, becoming an organic mode, a biological, though not devoid of intelligence, link in a huge technological infrastructure, called media civilization.

Technology, equipped with self-improvement and self-learning mechanisms, is becoming more and more independent, liberating itself gradually, but systematically, from human control. Intelligent solutions, based on artificial intelligence and speech simulators, allow to achieve the effect (illusion) of full humanoidization of media. The latter cease to be mere intermediaries in social communication and become the main players. Their "rationality", deprived of human affectivity or sense of morality, allows them to quickly make decisions based on constantly developing algorithms and data. The way of processing BIG Data, inaccessible to the human mind, does not cause many problems for information technologies. Thanks to their extraordinary computing power, we obtain sets of analyses in various configurations at the same time.

Memorizing and processing data is no longer the ultimate achievement of the human mind. Just like speech and the ability to use symbolic language. The role of direct communication is dimin-

ishing in favour of using new computer languages and understanding the logic and info aesthetics of the media. Technology and new IT languages are "colonizing" the space and strategies of human thinking about our own social and intrapsychic experience.

Learning, perceived as a key human activity, leads not only to observable changes in behaviour, but also to neurobiological and neurochemical changes, including the functioning of CUN, already on a scale of 1–2 generations. Thus, changes in the structure of the brain take place, which translate into preferred forms of social communication (Parsons, 2017).

Learning and acquisition of new key competences is increasingly less associated with formal education. The Internet and the new mobile media are becoming not only a post-traditional educational institution, but also – apart from speech, writing and printing – a completely new paradigm of social communication (Palmer, 2016). They increasingly influence formal education, such as e-learning, hybrid/mixed education or MOOCs (Massive Open Online Courses). The example of the latter clearly shows how WEB 2.0/Web 3.0 culture determines the form of education of new generations of its users and content producers. If we juxtapose the ideas of xMOOCs and cMOOCs, the paradigm shift in education (from traditional to post-modern) becomes even more visible. In the latter case, it is the learners who decide on the objectives of education and the forms of education, while the teacher organises the process and monitors its effectiveness.

The development of neuroscience, coupled with cybernetics, automation, robotics, genetics and research on artificial intelligence, has identified cognitive resources and processes necessary for the development of digital, media and information competences. The most readable and convincing proposal in this area is Bloom's digital taxonomy. It distinguishes six key activities to which specific mental operations are subordinated. This is based on two extreme dimensions: "Higher Order Thinking Skills" (HOTS) and Lower Order Thinking Skills (LOTS).

Bloom's Digital Taxonomy		
Verbs		
Key Terms	**Higher Order Thinking Skills**	**Communication Spectrum**
Creating	**Designing, constructing, planning, producing, inventing, devising, making,** programming, filming, animating, blogging, video blogging, mixing, re-mixing, wiki-ing, publishing, videocasting, podcasting, directing, broadcasting	Collaborating Moderating Negotiating Debating Commenting Net meeting Skyping Video conferencing Reviewing Questioning Replying Posting & blogging Networking Contributing Chatting e-mailing twitter-ing/microblogging instant messaging texting
Evaluating	**Checking, hypothesising, critiquing, experimenting, judging, testing, detecting, monitoring,** blog commenting, reviewing, posting, moderating, collaborating, networking, refactoring, testing	
Analyzing	**Comparing, organising, deconstructing, attributing, outlining, finding, structuring, integrating,** mashing, linking, validating, reverse engineering, cracking, media clipping	
Applying	**Implementing, carrying out, using, executing,** running, loading, playing, operating, hacking, uploading, sharing, editing	
Understanding	**Interpreting, summarising, inferring, paraphrasing, classifying, comparing, explaining, exemplifying,** advanced searches, Boolean searches, blog journaling, twittering, categorising, tagging, commenting, annotating, subscribing	
Remembering	**Recognising, listing, describing, identifying, retrieving, naming, locating, finding,** bullet pointing, highlighting, bookmarking, social networking, social bookmarking, favouriting/local bookmarking, searching, googling	
Lower Order Thinking Skills		

Andrew Churches Model;
edorigami.wikispaces.com; CC BY-SA licence

Towards the child

An important task of contemporary educational reformers, who deal with the practical side of media education, is to reduce the previous findings related to the diagnosis of civilization and the description of the state of the media to certain specifics. It is worth considering this issue in relation to the most vulnerable recipient of content and user of some technologies, i.e. a child. This is all the more justified as the market of media products addressed to the age group of 2.5–7 year-olds is growing dynamically, and many of them use the marketing slogan: "educational product". In many cases, their design does not take into account the real cognitive potential of a child of this age, not to mention his or her media, digital and informational skills.

If we take into consideration semiotic thinking, each such product should include the recipient of a virtual media, implied by the author and implementer of a given media concept (both in the form of technology and the media message). In order to see if the cognitive abilities of the child are compatible with the product requirements, a specific analysis of both factors should be carried out. As far as the child is concerned, I suggest using one of the most popular tools used in psychological and speech therapy diagnosis.

The SON-R (2.5–7) test[2] consists of six subtests for the learning of spoken and written language. It enables the diagnosis of right-hemispheric and left-hemispheric preferences and the calculation of the child's developmental age for each function and the intelligence quotient. It is a diagnostic tool that allows to calculate the mental age of the examined child concerning five mental functions and the intelligence quotient in a group of speaking children and in a group of children with language communication disorders. The examina-

[2] The test is aimed at children from 2.5 to 7 years of age. In practice, it is most often used to test children who do not develop speech correctly or who have reading difficulties. Authors: Snijders-Oomen, Peter Tellegen, Marjolijn Winkel, Barbara Wijnberg-Williams, Jaap Laros. Users of the test: psychologists, speech therapists. Standards for the test have an international character.

tion of each sphere starts with tasks for two-year-old children, which provides the possibility to check the functioning of the child from the 24th month of their life.

The SON-R test examines cognitive functions such as:

1) the ability to categorise;
2) visual analysis and synthesis on athematic (symbolic) material;
3) visual analysis and synthesis on thematic material;
4) concentration and direct memory;
5) graphoperception.

Table 4. Cognitive functions and related skills

Cognitive functions	Specific skills in relation to the tasks
Categorisation	Simultaneous and sequential processing; activation of both hemispheres of the brain; willingness to learn language concepts; ability to see similarities and differences between objects; analogy; knowledge transfer and task solving strategies for new material;
Visual analysis and synthesis (athematic material)	Sequential processing and activation of the left cerebral hemisphere; ability to organize information linearly and sequentially present it; ordering material from left to right, imitating behaviour, in action on specific elements;
Visual analysis and synthesis (thematic material)	Simultaneous processing of information and activation of the right hemisphere; determination of the level of imitation skills; visual-motor concentration; level of synthesis of various materials;
Concentration and direct memory	Self-control and task focus; understanding of non-verbal instructions; direct memory, independent search for ways to solve tasks;
Graphoperception	Imitation and cooperation, execution of sequential precision movements, activation of the left cerebral hemisphere. Obtained results allow to determine readiness to imitate speech, visual and motor coordination; visual perception, manual dexterity.

Developed on the basis of: http://www.testresearch.nl/sonr/sonr257manual.pdf [23.0618].

All these cognitive functions play an important role in the understanding and interpretation of media messages. Initially a (2.5–4 year old) identifies a favourite program, recognizes his favourite characters, can express different emotions and attitudes towards them (verbally and non-verbally). Up to the age of three, the young viewer is very susceptible to the formal features of the messages, e.g. dynamic editing or loud music. It is these (audio)visual stimuli that trigger an orientation reflex. While concentrating on the expressive elements of the message, the child has a problem with a more analytical understanding of its content, especially as the message is constantly changing on the screen. The role of the caretaker is to gradually build and develop this skill by analysing particular fragments of the message and, if possible, referring to the child's extra-media experience. In this way, the child learns that the media world is, in a certain part, a representation of the real world. The idea of representation is gradually created in the child's mind. Thanks to conversations about media with adults, the recipient at this age also learns to see the differences and similarities between different messages; he or she begins to see the differences between different media (e.g. a fairy tale in a book and a film fairy tale).

At the age of 4–6, he gradually learns to recognize genre patterns, understands cause-and-effect relationships, and identifies relations between the characters. He can also intuitively and with the use of media experience predict the development of action (5.5–7 years of age). A child of this age also recreates, in the form of thematic or symbolic games, those sequences from films or fairy tales that are most memorable to him/her, also because of their "emotional burden", both positive and negative. A child over 6 years of age gradually develops the skill of cognitive decentralization, which enables him/her to look at the media reality "through the eyes of another person".

Direct interactions (in the offline space) also make it possible to imitate the media behaviour of caregivers, who at this stage of development should actively mediate in these contacts (as models of desired behaviour, initiators of various media activities and "trans-

lators" of online reality). In this context, psychologists write about different types and functions of mediation (Kołodziejczyk, 2013). To sum up, the development of a child's media competence in relation to audio-visual transmissions takes place until the age of 7, according to the following stages:

- the level of indicative responses;
- the level of separation of particular significant elements (e.g. objects, characters) from the message;
- the level of combining elements into larger significant wholes (e.g. according to the principle of their formal similarity);
- the level of understanding of relations between elements and simple narratives (e.g. based on cause-effect relationships or belonging to a specific set of objects – categorisation);
- the level of recreation of some media situations or imitation of the media behaviour of the characters in play (first individually, then in cooperation with other children);
- the level of understanding of the concept of representation, i.e. the relationship between a fragment of the message and a fragment of external reality;
- the level of identification of differences and similarities (formal, content) between different messages;
- the level of conscious attention management and active concentration on different elements of the message, including the social context in which the protagonists operate;
- the level of ability to apply the guidelines/instructions from the message to act in the real environment;
- the level of anticipation of action development on the basis of previous media experience.

As can be seen from this synthetic description, media competence develops on the basis of various cognitive functions. However, it is not an automatic process. It requires a great deal of commitment on the part of caregivers, whose task is to shape, from the very beginning, the right attitudes and behaviours towards the media. Home media education becomes the basis for desired media activi-

ties, which favour, among other things, the development of critical thinking and the ability to cope with disinformation at subsequent stages of development.

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