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Article · May 2019

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NEW PROBLEMS IN PSYCHOLOGY CAUSED BY THE IMPACT OF DIGITAL TECHNOLOGIES ON HUMAN BEINGS

Summary

The life of a man of the 21st century is in many respects strikingly different from the life of previous generations. For the first time, the nonphysical world has become an objective reality which people not only perceive and internally experience (the book, the theater, the cinema, the television), but with which they directly interact and even manipulate its objects. The emergence of the digital world calls for a study of the

phenomena that are the consequence of the parallel existence of the personality in the real and surreal worlds. It is especially important to study the impact of computer technologies on children who are more likely to come into contact with objects represented in gadgets than with the same subjects, but existing in reality. Researchers of the G.S. Kostyuk Institute of Psychology of the National Academy of Sciences of Ukraine conduct research on the influence of excessive interaction of the child with the virtual world. Some of the results of these studies are outlined in this work.

Introduction

The modern world and the existence of man in it confronts psychologists with unexpected tasks, the emergence of which could hardly have been foreseen a few decades ago. The rapid development of digital technology, the penetration of virtual reality into all spheres of life generates various phenomena in the development of the personality, caused by mixing of physical and non-physical reality. Before our eyes, the projected, artificially constructed world is becoming more and more real, or rather, is being perceived as such by its user who in some cases can be said to be its "full" tenant. The appearance of helmets of virtual reality allows their owners to "move" in a non-existent space, "interact" with unreal objects.

This situation requires a radical review by psychologists of their views on the person's knowledge of the surrounding reality, the appropriation and generalization of this knowledge, the construction of a model (map) of the world, and the mastery of the orienting basis of actions in it.

In many ways, the derivative of this first question – the way of cognition of the world – is the problem of the I-image, the complexity of its formation in adolescence, when it is possible to cognize two completely different worlds really existing for a particular person at the same time – physical and digital. Fluctuations caused by various influences of the surrounding environments, contribute to the possibility of the emergence of a plurality of personality, which is a consequence of not disease, but of constant interaction with worlds that do not coincide in their parameters. The study of changes related to the I-image is complicated by the specifics of the study of the phenomenon, the high metaphoricity of the information obtained, and, consequently, the complexity of its generalization.

Modern psychology, especially child psychology, pays much attention to the influence of games on the formation of the child's personality, its cognitive development. At the same time, the main attention is paid to the content of games, questions of the connection of certain characterological

features of children with their interest in those or other games are discussed. This approach is quite important, but there is another side which is often overlooked, namely the physical essence of virtual reality. As a matter of fact, there the child operates with two-dimensional quasi-space, which only imitates three-dimensionality.

The digital world changes very fast. The phenomena generated by it are incredibly diverse, changeable, and require careful study. The great science fiction writer of the 20th century, Isaac Azimov, wrote about robopsychology and robopsychologists who deal with the problems of robots. Our world has not yet lived to this level, but perhaps it's time to create a special psychology of the virtual world that would study this incredible product of our time. However, while this psychology has not yet been created, let us dwell in this article on brief coverage of individual problems which interest the researchers of the Laboratory of Psychodiagnostic and Scientific Psychological Information and of the Laboratory of Modern Information Technologies of the G.S. Kostyuk Institute of Psychology NAPN of Ukraine.

1. Features of I-image formation of computer dependent adolescents

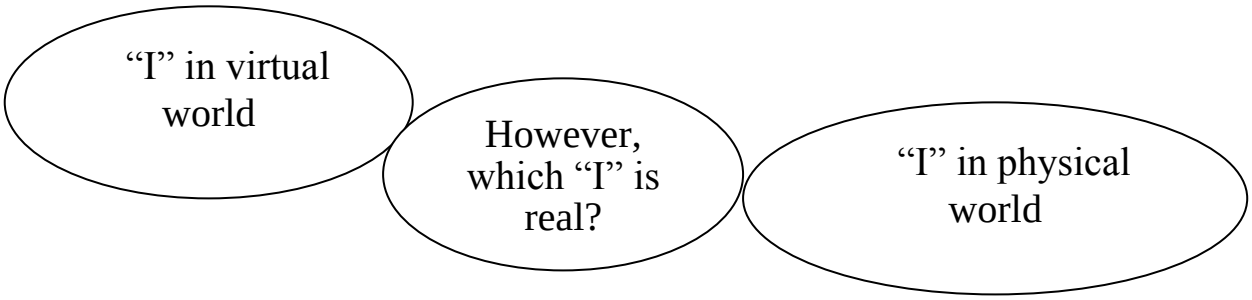
Adolescence is a rather difficult period in the formation of a person, the formation of his personal self-image, the I-image. It's not the child, but not even the young man (or woman) who begins to search for his or her identity, tries himself (or herself) and his or her relatives for strength, tries to build a vision of the world in which he (or she) would occupy a worthy position. The period of adolescence has always been extremely difficult, but at least it was possible to determine the circle of communication and interests of the child in which his or her formation takes place, and therefore identify possible causes of problems. However, even the finding of pain points did not guarantee the solution of problems at all, because only the adolescent himself (or herself) could solve them and no one else. Reasonable, loving and understanding adults could only track the process and to some extent push (but, unfortunately, not direct) it to a safe channel. Now the situation is even more complicated. Any person wants to look in their eyes (and if possible, in the eyes of significant others) a worthy, respected (even "cool"), beloved one. This is especially important in adolescence. In order to deserve the appropriate attitude in the "real world" you need to make "real efforts" (if the group requires, the teenager can demonstrate both deviant and even delinquent behavior). And the virtual world can contribute to this. Recently, in Ukraine, as in some other countries of the post-Soviet space, there has

been a movement of the “blue whales”, which pushed teenagers to suicide. As shown by studies conducted by L.A. Kondratenko, L.M. Manylova and O.Yu. Chekstere, potential suicideres virtually have no real reasons for such an act, but there is pressure from both peers and groups in the social network. In fact, such a group in reality may not exist at all, and a kind of “curator” just simulates it for the sake of making a profit from putting a video of a real suicide on the Internet. One of the time-sufficed potential suicideres said that he was not very respected at school, and when he became a member of the “death group” and reported this to classmates, he immediately felt himself to be someone important. He was taken to the company of the “coolest guys” of the class, and the girls began to send “valentines”. Of course, the approach of the moment when it would be necessary to commit a suicide was scaring. But no less frightening was the fear of what would happen to him if classmates found out that he was scared. Fortunately, he had the intelligence to stop in time and tell everything to his family. Although the school, unfortunately, he had to change. The authors note: “What makes people like him come into play? The children of this age are characterized by a desire to assert themselves, to become someone important, to find a group of friends who would concider them special”. If a teenager does not find such friends in the real world, then he (or she) begins to look for them in virtual one.

Having gone deep into the jungle of social networks, a teenager may gradually lose touch with reality, falling into the so-called “dissociative trance” (John Suler), and in that state his (her) criticality of perception is reduced sharply, he (she) becomes vulnerable to suggestions and manipulations with his (her) consciousness. In addition, virtual games create the illusion of “multiplicity of life” or even of “non-existence of death”. Such a teenager, jumping from the roof of the house, does not really believe in his or her own death, he (she) assures himself (herself) that either someone will save him (her), or he (she) will simply “fly to another world where everything will be better” [14].

A study conducted by a post-graduate student of Laboratory of Psycho-diagnostics, Scientific and Psychological Information D.L. Pugachev, revealed that computer addiction of younger teens can generate two separate I-images, one representing the child in social networks, and the other – in real physical world. And the characteristics of these images only partially coincide, and in the most severe cases of escape into the virtual world practically do not coincide. There are two subpersonalities, but the formation of the true “I-image” is significantly inhibited, because the

teenager often does not want to perceive reality, he (or she) is more satisfied with a personal presentation in a world where no one and nothing requires confirmation of the declared qualities. There is a paradoxical situation, which is very schematically shown in the following figure.

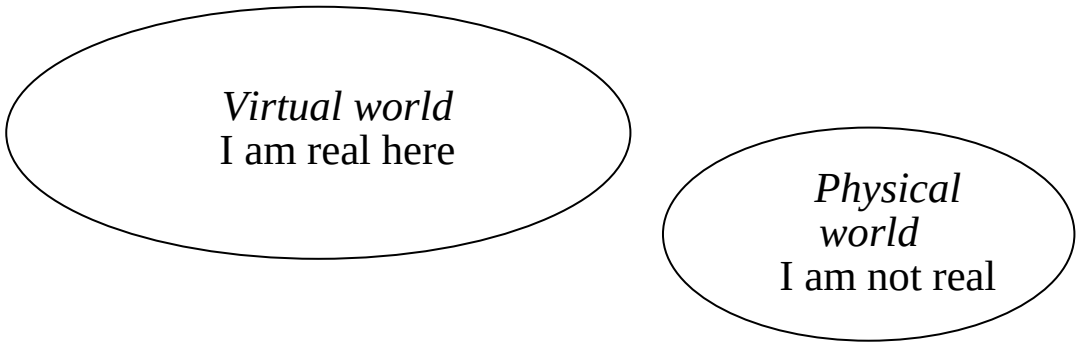


The stronger the bond between the members of the group in the social network, the stronger its influence on the adolescent, the more dramatically can be the difference between his (her) self-presentation in real and virtual worlds. It should be noted that the group of interests (if, of course, it does not have a destructive nature, as the above-described death group) can even have a positive impact on the behavior of a teenager in real life, as he (she) gets additional information that improves his (her) image among classmates. Interest groups (embroidery, caring for plants, beloved animals ...) are more the prerogative of girls, although there are many fans of peculiar directions of teenage subculture (emo, Goths, etc.) among them. However, these directions are less connected with the dependence on the Internet and are a usual protest reaction to the adult world. Over time, such hobbies, as a rule, dwindle.

The situation with network gamers is much more complicated. They form quite strong communities with their complex hierarchy of relationships. Simultaneously, in many gaming communities, there really are “social elevators” allowing you to rise from level to level. The teenager gets an imitation of self-realization, and the possibilities of virtual reality form in him (her) an idea of his (her) omnipotence. A 13-year-old teenager who categorically refused to go to school on Tuesdays, Wednesdays and Fridays, was brought to the psychodiagnostics laboratory, claiming that these days he must be online, otherwise he will fly out of his level of play, and this can lead to bad consequences for his whole life. At the same time, he argued that “... school is stupidity, it sucks. Knowledge, that they smuggle in there to suckers, nobody needs. The real life is being held online. There are really

cool guys who will soon rule the world. He already knows how to win and knows what he wants. He already participates in a game where one can earn steep doughs. When he collects enough bonuses, he will exchange them for loot and open a bank with a group of friends. The center of the bank will be in Geneva because only in Geneva the real money is spinning". At the same time, the future banker did not even know where Geneva was and did not understand the currencies of different countries at all. In real life, he has no friends. He responds extremely pejoratively about classmates, considers them idiots, unable to pass even the first levels of a more or less complex game. Own self-esteem is overstated and meets the ideas about himself, formed in the virtual world.

Of course, the described case is not the most typical situation, but reveals a certain tendency when a teenager, who feels dissatisfaction with his status in the real world, is looking for salvation from discomfort by going to virtual one. In this case, even a family that loves and supports the child can contribute to such behavior. Thus, in our case, the boy from childhood was told about his exclusivity, his relatives admired his ability to handle various gadgets, believed that communication with "unworthy" children could be bad for him, and therefore rejoiced when he preferred sitting in front of the computer screen to "aimless" (according to the mother) running around with other children in the yard. It is clear that such a strategy did not contribute to the timely socialization of her son, and hence the problems at the school emerged, which became an additional impetus to closing himself in unreality. Schematically, this situation can be represented as follows:



Similar trends, even if only emerging, in the development of the individual, the very possibility of the appearance of a virtual personality, cannot but cause alarm, because it destroys the notion of a person as a "social animal" (Aristotle) and is fraught with the emergence of populations of "computer self-guerrillas" living "outside society".

Of course, the difficulties of self-identification caused by the influence of the virtual environment have many aspects related not only to the formation of the I-image by adolescents. Their constantly changing influence on the social life of society requires further careful study.

2. Model of the world or models of the worlds

The problem of the formation of the I-image by computer-dependent adolescents is closely related to the question of the adequacy of their perception of the world (worlds). Unfortunately, this problem has not been fully solved with respect to a single physical world. For a long time, Lenin's theory of reflection prevailed in Ukrainian psychology. In accordance with it, "nature is reflected in the human brain. A person comes to objective truth by checking and applying the correctness of these reflections in practice and in technology" [16, p. 183]. The very concept of "reflection" always embarrassed psychologists, because its lexical meaning implied a purely mechanical process, which in no way corresponded to the complexity of the phenomenon. One of the leading Ukrainian methodologists of psychology, G.A. Ball, proposed (the first publications date back to 1978) a system in which reality is not reflected by a person with subsequent verification of correspondence of the mapping to the truth, but it is consciously perceived and interiorized immediately. Moreover, this process does not even take place in all parameters accessible to consciousness, but only in those that are necessary for solving a specific problem. The "created" model of reality becomes a transitional link between a person and reality, which is refined and supplemented in the course of practical application. According to G.A. Ball, the model of reality is an ideal system, which, due to its **structural similarity to reality**, can be used as a carrier of information about it [2, p. 8].

Developing and enriching the concept of the mental (in the G.A. Ball's system – the ideal or theoretical) model of the world, M.L. Smulson notes that this type of model "is a psychological construct that captures the result of cognition of the world by a person, with each substructure and function of the intellect contributing to the content of the mental model. The mental models of the world record the content and level of understanding of the self, other people and the environment. They are closely concerned with the knowledge and beliefs of the individual, with intellectual processing (reflection, perception, imprinting and interpretation) of personal experience... Mental models of the world are internal psychological mechanism of interpretative process, and understanding of the world and the relevant actions are determined... by interpretational schemes. Therefore, our

individual or group mental models... design our world (constitute our world)" [20, p. 25–26].

Proceeding from the understanding of the mental model offered by M.L. Smulson, let us try to analyze the situation when a teenager-gamer spends more time in a virtual rather than in the real world, and accordingly constructs the corresponding mental model. Of course, since he (she) does spend some of his (her) life in the real world, he (she) also has his (her) acting model. However, what is the relationship between these models? Strangely enough, to illustrate possible phenomena, let us turn not to the present, but to a very old literary work – the famous novel "The Cunning Hidalgo Don Quixote of La Mancha" written by Miguel de Cervantes Saavedra at the very beginning of the seventeenth century (it is known that the first part was published in 1604). The main character of this novel behaves exactly as our computer-dependent contemporaries do. The only difference is that his dependence arises on the basis of his passion of knightly novels: "You must know, then, that the above-named gentleman whenever he was at leisure (which was mostly all the year round) gave himself up to reading books of chivalry with such ardour and avidity that he almost entirely neglected the pursuit of his field-sports, and even the management of his property; and to such a pitch did his eagerness and infatuation go that he sold many an acre of tillage land to buy books of chivalry to read, and brought home as many of them as he could get…In short, he became so absorbed in his books that he spent his nights from sunset to sunrise, and his days from dawn to dark, poring over them; and what with little sleep and much reading his brains got so dry that he lost his wits. His fancy grew full of what he used to read about in his books, enchantments, quarrels, battles, challenges, wounds, wooing, loves, agonies, and all sorts of impossible nonsense; and it so possessed his mind that the whole fabric of invention and fancy he read of was true, that to him no history in the world had more reality in it" [23, p. 119–120].

It should be noted that such a high level of dependence on books could arise only when the dependent had an extremely developed imagination and, while reading the books, practically not only "saw" what was happening, but could also mentally "enter" the plot of the novel and begin to act on a par with heroes of the book. That is, a man with the power of his own thought carried out the process of virtualization of reality, which modern gamers get ready with the opportunity to enter the surreal world and interact with it. And then he did the same as any self-respecting gamers do – chose a nickname (Don Quixote of La Mancha) and an avatar (a knight in white

shiny armor), picked up the necessary "gear" (helmet, armor, spear, etc.) and went on a tour to the real world, since, unfortunately, the computer reality has not yet been created. "So, without giving notice of his intention to anyone, and without anybody seeing him, one morning before the dawning of the day (which was one of the hottest of the month of July) he donned his suit of armour, mounted Rocinante with his patched-up helmet on, braced his buckler, took his lance, and by the back door of the yard sallied forth upon the plain in the highest contentment and satisfaction at seeing with what ease he had made a beginning with his grand purpose. But scarcely did he find himself upon the open plain, when a terrible thought struck him, one all but enough to make him abandon the enterprise at the very outset. It occurred to him that he had not been dubbed a knight, and that according to the law of chivalry he neither could nor ought to bear arms against any knight; and that even if he had been, still he ought, as a novice knight, to wear white armour, without a device upon the shield until by his prowess he had earned one. These reflections made him waver in his purpose, but his craze being stronger than any reasoning, he made up his mind to have himself dubbed a knight by the first one he came across, following the example of others in the same case, as he had read in the books that brought him to this pass. As for white armour, he resolved, on the first opportunity, to scour his until it was whiter than an ermine; and so comforting himself he pursued his way, taking that which his horse chose, for in this he believed lay the essence of adventures" [23, p. 125–126].

And here Cervantes gives an absolutely stunning description of the superposition of the mental model of the virtual world in which there is a hero and the picture of the real world. Since "everything he saw or imaged seemed to him to be and to happen after the fashion of what he read of, the moment he saw the inn he pictured it to himself as a castle with its four turrets and pinnacles of shining silver, not forgetting the drawbridge and moat and all the belongings usually ascribed to castles of the sort. To this inn, which to him seemed a castle, he advanced, and at a short distance from it he checked Rocinante, hoping that some dwarf would show himself upon the battlements, and by sound of trumpet give notice that a knight was approaching the castle" [23, p. 128]. As we see Don Quixote interprets the world in those images and concepts that he interiorized in the process of constant reading of knightly novels.

Of course, the image of Don Quixote is exaggerated in many respects, because Miguel de Cervantes sought to write a parody of a knightly romance, and not to conduct a serious psychological study. However, the

fame, which was gained almost immediately by his work, shows that the situation was close and understandable to readers, and the book (maybe even against the author's will) revealed a problem that really existed, albeit in other forms.

The modern active gamer, like Don Quixote of La Mancha, "gets on with" the realities that the virtual world shows him or her. Creating his or her mental model, he or she (even without realizing it) builds a structure that would allow the most successful orientation in digital reality and effectively solve the problems that arise in the game. The more similar games attract a teenager, the less is the set of properties considered in the construction of the model and the "harder" its structure. Fans of "arcades" differ from admirers of "strategies" and "simulators", and they all do not look like fans of different types of "shooters", etc. The level of "rigidity" of the mental model of the virtual world determines its stability in interaction with the world of reality. In the case of the existence of a persistent virtual I-image, its carrier can completely move the real I-image into the subconscious. The virtual model of the world is superimposed on the real one and exists as a kind of shadow (or even a veil) on its surface. One can assume that it is possible to completely obscure the real-world model by the virtual one (the situation of Don Quixote), but such cases have not been encountered in the practice of the authors of the article. At the same time, the study of the behavior of computer-dependent gamers revealed examples of completely absurd acts, which are a consequence of transferring the norms of computer games to real life.

3. Features of cognitive development in the reality of simulacrum

While studying the characteristics of the impact of computer technology on children and adolescents, the main attention is usually drawn to the impact of the virtual environment on the social development of man. The semantic component of games, social networks, and blogospheres is explored. Less attention is paid to the analysis of the computer world (worlds) as actually existing, with its specific parameters and phenomena. So, although the virtual world is a kind of simulacrum ("imitation of nonexistent" [5, p. 16][1]), it is generated by physical devices and manifests separate quasiphysical properties: there are space and time, speed and motion, volume and size... But as in every simulacrum, any distortions of the visible world are possible here. So, for example, the space-time continuum,

[1]If we accurately quote Jean Baudriyar, then: "A simulacrum is never that which hides the truth – it is a truth that hides that it does not exist" [5, p. 16].

and the space and time themselves begin to exist “outside” the usual laws (space – two-dimensional?, three-dimensional?, four-dimensional?... or generally n-dimensional?, time-slowing down?, accelerating?, moving to the past?, making a loop?...). Existence in the world with such unstable characteristics requires the accelerated development of new and unusual abilities of children and, unfortunately, inhibits the formation of traditional cognitive abilities that allow to exist effectively in the real physical world.

Modern children, according to the accurate expression of G. Smoll and G. Vorgan are already a completely new type of children, called “Digital Natives”. Such children perceive the world in a different way than their parents and even older brothers and sisters who were not “digital from birth”, they think differently and even feel differently. The rapid development of ICT leads to the fact that “new neural mechanisms appear in the brain of technically literate young people – and as a result, the mode of work changes, the brain develops differently” [19, p. 49]. “The daily impact of hi-tech-computers, smartphones, video games, Internet search engines – causes nerve cells to change, throw neurotransmitters and unite into new networks (while the old ones are gradually being destroyed) .The digital revolution that occurs before our eyes forces the brain to evolve right now – and in an unprecedented pace” [19, p. 14].

A man of the 21st century lives in a very unusual world in which it sometimes begins to seem that various gadgets are gradually turning from simple technical means designed simply to help solving problems of everyday life more efficiently and faster into some newly appeared deities to meet the needs of which people only exist. The world expands to the boundaries of the universe, but at the same time narrows to the screen of the TV, tablet, iPad, iPhone and others like them. We communicate more often in a chat than we talk at breakfast with the family (if now there is such a thing as family breakfasts, lunches and dinners). We sit with classmates on facebook, instead of coming to the meeting of graduates to their native school, we play “Angry Birds” unable to tear ourselves away from the screen and bring bread from a nearby store (simultaneously feeding the real birds and listening to their singing). The mobile phone has become almost an integral part of the person without which it feels lost in the crowd. Children at the school break do not play with each other, but they take out iPhones and iPads and begin to compete rapturously with the heroes created by someone else’s imagination. There, in this unusually attractive other reality, everyone, without the slightest tension of his/her imagination, can feel him-/herself as anyone – a king, a president, a hero, a researcher of new

worlds and the creator of new planets. It is possible to turn into a monster or a handsome, transformer or an elf – no restrictions and at the same time no own creative efforts. All that is necessary – from space complexes to buttons on clothes or hairpins in a hairdo – is given ready; nothing needs to be created by yourself. Creativity is an excess ability; it prevents one from choosing from the list of available items. Immersion in the fairy-tale world has never happened so easily in the history of mankind, and therefore did not attract so many adepts who believe that they own the screen reality, and not the screen reality owns them. Children who have never lived in a pre-computer world already simply do not understand how one can exist without it, for they feel that they are its full citizens.

Psychologists around the world carry out the study of the impact of new information technologies. Psychologists in Ukraine make their own contribution to the study of this problem. In particular, the longitudinal study of changes in cognitive development of children, which was conducted in the Psychodiagnostics and Scientific Psychological Information Laboratory of the G.S. Kostyuk Institute of Psychology of the National Academy of Sciences of Ukraine for 25 years (1988–2013)[1], revealed a direct dependence of the development of individual cognitive indicators on the growth of the number of gadgets that were at the disposal of children.

The study began in 1988, when children, then of the Soviet Union, practically did not have any computers at their disposal. So, in a secondary school located in the new district of Kiev (Obolonsky), less than 0.5% of parents had computers at home, some of which were self-made and could perform only the simplest functions – most often they were used as typewriters, sometimes as calculators. Children were not allowed to use such devices. Such devices did not cause big interest in schoolchildren. However, since the mid-90s, the gradual penetration of computers (as well as various types of game consoles) into everyday life of Ukrainians began. Admittedly, it was the game consoles (and not the best quality ones) that were the first gadgets, under the influence of which children quickly became involved. But a special flourishing of children's enthusiasm for the virtual world began in Ukraine with the advent of the twenty-first century. A survey of primary school pupils conducted in 2009–2013 in Kiev, Lviv and Chernigov schools showed that most children first met the computer at the age of 5–6,

[1]The study involved: Yu.Z. Gilbukh, E.P. Vereschak, V.A. Georgievskaya, S.A. Goncharenko, N.A. Guba, L.A. Kondratenko, S.L. Korobko, L.M. Manylova. Testing was carried out in the Kiev, Donetsk, Zakarpatye, Zaporozhye and Odessa regions.

and approximately 25% even earlier [E.Yu. Gyrchenko, O.Yu. Chekstere and unpublished experimental materials of the psychodiagnostic laboratory of the G.S. Kostyuk Institute of Psychology of the National Academy of Sciences of Ukraine]. There are evidences of parents that they attracted their kids to the so-called "developing" computer games even before they reached the age of two. Such children were trained in primary manipulations with the computer simultaneously with mastering the ability to walk and much earlier than they had mastered the ability to speak. Some parents entrusted the child to a gadget to some extent, believing that interaction with the computer indicates a high level of mental development of their offspring, and specially selected games can replace manipulations with real objects. In reality, however, playing with real objects requires the attention of elders (parents, grandparents, nannies or at least older brothers and sisters), which creates certain difficulties for adults, requires time, attention and responsibility. Playing with a computer does not require a real human-human interaction. The program simulates the activities of such a partner, but, in fact, it is just an imitation. In fact, the child communicates with him-/herself, because he/she can always choose a program that speaks "their" language and offers **the easiest** form of interaction for him.

Comparison of the results of testing conducted at intervals of 2-3 years, with the help of the same set of techniques and encompassing children of the same age group (6–7,5 years), showed the following statistically significant changes (average results are given)[1]:

1. Decreased volume of auditory memory. (According to Wexler's test from 10,2 to 9,5). Teachers with extensive experience note that modern children experience difficulties in memorizing verses, sometimes they cannot repeat (or at least convey a general meaning) the teacher's words, they cannot cope with retelling the text just read.

2. Deterioration of attention indicators (from 12.2 to 11.5). Pupils badly notice the details of the picture, "do not hear" important elements of the story, the riddle, the mathematical problem, etc. Teachers have to emphasize constantly children's attention on important points of the lesson.

[1]An analysis of the results of this research is given in the monograph "Psychological diagnostics of peculiarities of cognitive development of junior pupils in the conditions of the information society", edited by S.A. Goncharenko and L.O. Kondratenko. – K. – Kirovograd : Imex LTD., 2014. – 228 p.

3. The deterioration of spatial thinking in three-dimensional space (from 14.1 to 13.6), but also a significant improvement of spatial thinking in two-dimensional space (from 10.8 to 12.5).

In addition, it was recorded during the study:

4. Deceleration of the decentralization development. An experimental study conducted by O.Yu. Chekstere showed that many primary school students continue to be egocentric, confident that the world should revolve around them and perceive the teacher's attention to other children with irritation (and sometimes aggression).

5. Clip (NET) thinking, when a pupil cannot present the text of a story or a movie – he/she breaks up into separate bright parts, sometimes almost unrelated.

6. The deterioration of analytical-synthetic thinking, the reluctance to comprehend information, the desire to replace the solution of the problem by a simple search of possible answers.

Of course, the above-mentioned phenomena are far from exhausting all the new phenomena that modern children demonstrate, but they show the significance and depth of the problem, the significance of its awareness for the restructuring of the whole process of education and upbringing.

Conclusions

The rapid development of new technologies, the ever more widespread penetration of computers and the virtual reality that they generate into the everyday life of virtually every inhabitant of the Earth poses unprecedented challenges for psychologists.

The single physical world of a man got its competitor – the virtual world, the life in which is strikingly different from life in the real world. The requirements of the two worlds form a new personality, the study of characterological features of which becomes the primary task of psychological science.

Particular attention should be paid to children and adolescents, for they are the brightest representatives of the "digital" generation with all its shortcomings and virtues. The studies, conducted in the G.S. Kostyuk Institute of Psychology of the National Academy of Sciences of Ukraine, proved that there are difficulties in forming the I-image and the image (model, map) of the world (worlds) in computer-dependent teenagers-gamers. The I-image can split into two independent I-images: I-virtual and I-real. And the I-virtual arouses more sympathy than the I-real. Therefore, the

teenager strives to get rid of the I-real (bringing discomfort) with the help of an increasing immersion in virtual reality.

Staying for most part of their lives in a virtual world, gamers (both teenagers and children of primary school age) build their model of the world(s) in which they live. However, when forming the I-image, they cannot completely escape from the real world, i.e. the merging of two models occurs, throwing the shadow of the world of the surreal onto the real world. This situation gives rise to errors in decoding the signs of the real world, causing deviations in behavior.

Special attention of pedagogical psychologists is attracted by changes in the cognitive development of "digital" children and the impact of these changes on their educational abilities.

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Гуманний розум : збірник статей (присвячено пам’яті Георгія Олексійовича Балла) / Інститут психології імені Г.С. Костюка НАПН України ; наук. ред. О.В. Завгородня, В.Л. Зливков ; уклад. С.О. Лукомська, О.В. Федан. – К. : Педагогічна думка, 2017. – С. 51–58.

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