

Mixed Objective-Virtual Reality: Theoretical Analysis of Basic Characteristics of Modern Education

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The problem presented in the article is relevant as it is substantiated by the fact that the emergence of mixed reality on the border of objective and virtual realities brings forth the necessity for philosophical comprehension of the phenomenon of new extended educational space, and philosophical-methodological validation of new training techniques development. The objective of the article is to define theoretical bases and methodological principles aimed to create a new model of the educational environment within mixed "objective-virtual reality"; to reveal basic properties of "extended educational space" (spatiotemporal properties, etc.). The leading research methods are methods of modeling and analogy allowing to consider this problem as a purposeful and organized process aimed to improve the educational environment to implement efficiently the process of the modern person education and upbringing. The presented model of the extended educational environment has space – N-dimensional, and time that is reversible, tendency to self-organization and self-development upon the subject (teacher, student or special program) intervention. Such educational environment is not self-sufficient in the absence of one of the factors necessary for its being (special program, technical means, etc.). The article has valuable importance for experts-teachers and young specialists applying information-computer technologies in the educational process.

Keywords: modern education, mixed "objective-virtual reality", extended educational space, educational time.

INTRODUCTION

The modern person lives on the border of objective and virtual realities. New mixed reality received the name *Augmented Reality* (supplemented reality) in English-speaking literature. In Russian-speaking scientific literature it is designated

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by such concepts as "supplemented reality" or "extended reality" which often have synonymous meaning for national scientists (Zeynalov, 2014).

Unlike "virtual reality" which assumes a completely artificially synthesized world, the extended reality is supplemented and assumes synthesizing of objects of a natural and virtual row. The following characteristic features of new reality may be singled out:

1. Combination and synthesis of elements of the real and virtual worlds;
2. Interactivity;
3. Reproduction of virtual objects existing in the form of a potentiality in the numerical expression on the segment of the objective reality.
4. Combination of three-dimensional representation of objects with N-regularity.

Here subject-object relations change. Unlike classical rationality, the subject-object opposition disappears, the opposition of subjective and objective realities, ideal and material, real and fiction is ignored. New information-computer technologies generate a new configuration of the subject. They are endowed with new traits, the main of which are decentration and omnipresence. However it should be noted immediately that all these traits, including omnipresence, as well as domination over the new artificially created nature (M. Horkheimer and Th. Adorno) as the demiurge, is illusory. Due to this real (geographical and physical) space and new space of communication, owing to the improvement of communication means, contract, become omni available. New social-communication networks, including educational, are created. They involve more and more users, their attention, consciousness, and their "bodies".

To teach modern students huge volume of philosophical and culturological material using old methods (using a board, chalk, schemes, posters) is becoming impossible. The phenomenon of mixed "objective-virtual reality" becomes an integral attribute of the modern person being. It is new ontological reality where all spheres (economy, engineering, ways of communication, language, image) are mediated and determine the way of the modern person existence. Under its influence the thinking of people, the content of their consciousness that leads to transformations in the sphere of education changes. In education these technologies are demanded for the creation of training simulators. When using such systems the user has tremendous opportunities to operate the object of the research. That, in its turn, demands philosophical comprehension of the phenomenon of this sociocultural occurrence without which it is impossible to change the technique of modern training quickly. First of all, the reconsideration of fundamental factors of person's life (space and time since they have always been a priori for the person) and education (educational space and educational time) is required.

METHODOLOGY AND TECHNIQUES

Methods of analogy and modeling make the methodological basis of the research. Through many centuries the rate of experts' involvement in real social and economic processes has determined the development of a society in many respects. For this purpose necessary conditions of a society being were artificially modeled in educational space. *Modeling allowed* to construct a model by analogy of real-life objects (a subject, phenomenon, processes); to replace a real object with its suitable copy; to investigate objects of knowledge on their copies (Modeling, 2008).

The model-analog functions on the basis of "transfer of information" from a prototype to a model and back (Orekhov, 2009; Bush, 1972). Within educational space-model the learners gain theoretical knowledge and develop practical skills, and within modern education they gain competences which are necessary in real life. As a result the technique of educational space arrangement as a model on the basis of information-computer technologies application is proposed. The

investigation of virtuality modeling issues is present in N. Petrova's works (Petrova, 1999).

The application of the method of analogy allows to reveal some essential properties of virtual reality compared it with the most similar and more scientifically studied object of culture – *myth* (Elkhova, 2011).

The comparative method assuming the research of similarities and distinctions between phenomena or their classes to determine classifications and typology of social phenomena is also widely used in the article.

RESULTS

The creation of a valid model of education, as well as the creation of new forms and ways of training material presentation has become urgent in the context of widespread introduction of information-computer technologies in the educational environment (Yarullin, 2014). Modern higher education is not so much the transfer of knowledge, skills, but the development of the ability of analysis and synthesis, research and discovery, understanding and dialogue with another.

Thanks to the application of information technologies modern education is obtaining new outlines (Ganieva, 2014; Sadykova, 2014; Semushina & Galeeva, 2013). Each new information resource introduced into the structure of the educational environment changes the process of education not only from the point of view of its form, but its content as well (Anisimova & Krasnova, 2015; Golitsyna, 2013). In social development much depends on how precisely models of educational space and educational means correspond to objective processes which train on their bases and how they meet the requirements of time. It is about understanding of methodological bases of modern education that functions on the border of two worlds – objective and virtual. In this case there is a question about what should be understood as educational space and educational time? To answer these questions, it is necessary to define the content of the concepts "space" and "educational space", "time" and "educational time".

The analysis of the term "space" allows to say that from the point of view of objective reality, space is a general external condition of being, the form of the existence of matter that reflects the extent and arrangement of subjects in the world continuum, and their location relative to each other (Space and time, 2008). At the same time, space is a system of objects between which the relations on the basis of the principle of successive description are established (distances, etc.). One of the most important aspects of understanding space is the extent and relations between objects of the surrounding world.

Ideas of space-time have a specific historical character. Every epoch possesses its own chronotope, differently interpreting properties of time and space. Linear time is one of possible forms of perception of social time within European culture. According to A. Ya. Gurevich: "The modern ordinary mind is guided in its practical activities by abstractions "time" and "space". The space is understood as a three-dimensional, geometrical, equally extensible form which can be divided into commensurable pieces. Time is thought as pure duration, irreversible sequence of events occurrence from the past through the present into the future. Time and space are objective; their qualities are independent from the matter filling them" (Gurevich, 1972. p. 26).

The chronotope of extended reality, corresponding to certain classical notions of space-time, considerably differs from it. It is standard to consider that European culture, science and education resulted from overcoming of the myth (the movement of consciousness from the myth to logos), due to rationalism formation as type of thinking and methodology. New "global network culture", which major sign is its virtuality, is beyond traditions of rationalism. Myth and its elements

become necessary components of consciousness and culture of the present.

"In virtual reality space appears to be what is designed, modeled under the laws established in mythological consciousness of the person. The person plunged in virtual reality actualizes the processes of archetypical character and behavioural patterns forced out to the sphere of unconscious" (Elkhova, 2011. p. 28). Therefore, the myth was not overcome by rationalism, and manifested at the level of mixed global objective-virtual reality; it forces the person to live according to the laws of own chronotope where there are no space-time borders: the space is N-dimensional, and time is reversible.

Therefore, the content of such concepts as "educational space" and "educational time" changes. The space, in general, and personal space, in particular, is the foundation to create an educational environment model which acts as a dynamic unity of educational process subjects and system of their relations. The subjects of educational space are: a teacher, a student and active environment between them (training material and ways of its transfer, including elements of virtual reality applied by means of the Internet and computer technologies (fig. 1).

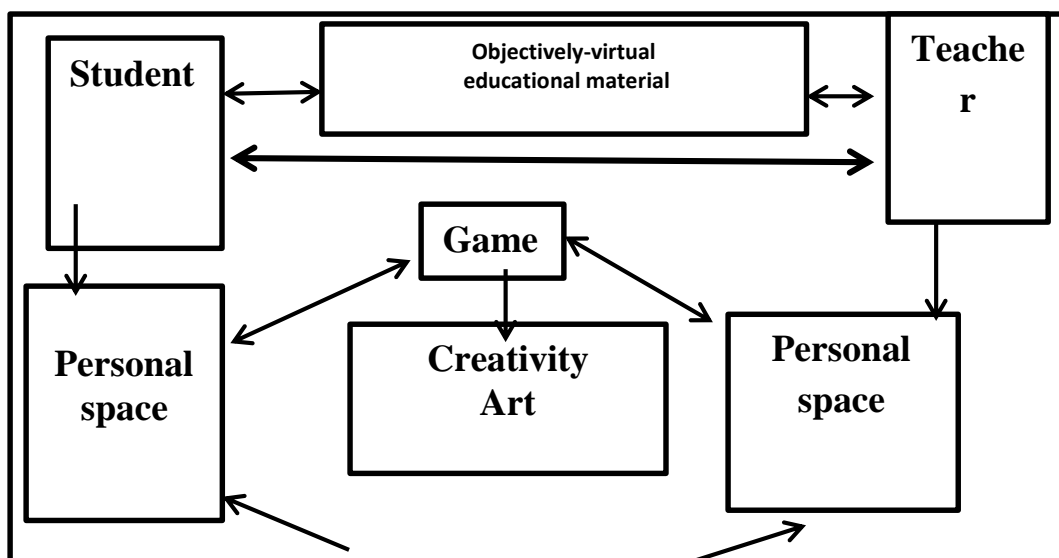


Figure 1. Model of mixed objectively virtual educational space

The model of an extended educational space represents a difficult open system tending to self-organization and self-development upon the intervention of the subject (teacher, student, special program). This environment is artificial; without participation of a subject or special program it is not self-sufficient. The application of ICT makes a mentally presented model visible through the visualization by means of technical facilities.

The objective of educational space modeling with ICT application is the organization of such educational space in which learners' individual-psychological and specific abilities for self-determination, self-development and self-knowledge in new unstable conditions of objective-virtual reality will be developed. It should be implemented to make the student learn to acquire knowledge independently, to be able to work with information, to see and quickly solve the problems arising in different areas. An important role in such extended educational space is assigned not only to information technologies, but the user as well, their ability to work with virtual phenomena, processes which as images practically supplement the natural space of the audience, the student and teacher's personal space.

Since the time of Aristotle classical education has been studying its subject

statically, independently from reality. Mixed objective-virtual reality makes a set of constantly changing phenomena in the similarity of unified unstable process. Modern education focuses student's consciousness on the infinity of changes processes and on their understanding (but not comprehension). "Extended educational space" is an artificially modeled environment consisting of objective-virtual elements necessary for training; in comparison with the objective reality it is a randomly arranged chaos where educational elements by means of computer technologies change with a huge speed. It is a created world in the state of continuous movement, not brought into being but existing in potentiality in a cross-cultural space "student – teacher – reality" as the result of continuous dialogue (Zeynalov, 2014). It is the stream of continuous multiple changes ("Hercules stream") misrepresenting the real and ended.

The main subject of education is the student (a learner), their consciousness. He acts as Platon demiurge (creator) that has unlimited freedom designing new versions of accomplished events, the one who subordinates the course of "virtual history" to the will, striking historical events, characters of various epochs in one temporal field, the one who establishes cause-effect relationships which are illogical since they do not correspond to realities of the objective world.

The availability of the computer and Internet gives the opportunity to turn any place at any time into educational space with unlimited opportunities. Here the relation between the center and periphery is washed away, multiple local subjective construction-realities (educational space) coexist, the teacher or learner can operate them; they may "extend" them by opening the access by means of the Internet and computer technologies to real processes – from space processes to surgeries in hospitals or to real natural phenomena. In this case the educational space is capable of compression or extension. Each student models their educational space, projecting educational process and personal environment. Here the educational space is a "border-zone" between two worlds, the bridge between the world of real events and "transformed" to digital signals virtual events necessary for the educational process.

The application of computer technologies changes the content of the concepts time and freedom. In a modern worldview there is an accurate distinction between the past, present and future (Artishcheva, 2014). The linear perception of time is interfaced to the idea of irreversibility. Information-computer technologies allow to rethink classical understanding of time which is characterized by duration, one-dimensionality, rhythm and irreversibility. Virtual time considerably differs from the real. It is multiple, multidirectional and immanent. In terms of the density of events in the educational space, the speed of the time movement considerably changes. It is operated, i.e. it either "shrinks", or "extends". If desired the "operator" (or learner) can stop time – a stream of virtual events by pressing the button, "click". In such case the stream of events movement from the past to the future is broken. The process of "the time movement" becomes operated, events of the past exist side by side with modern ones; the future that has not come is represented as actual. Hence there is the obtaining of a new quality of time, it is perceived as successively described, as space. Such property of virtual time makes the education continuous in time and space.

DISCUSSIONS

So, the virtual reality returns us to mythological perception of time. It, being a part of the modern person's life, creates a simulative being in which there are no elements of objective reality (or they are limited): finiteness and limitation of existence, the past and the future, pain and fear when at every moment of the

present there is the past and future. Here phenomena and events are one-time, cause-effect relationships are absent ("operator" acts as destiny).

The classical education born within Ancient Greek scientific tradition, since the time of sophists Socrates, Platon, Aristotle is focused on the development of rational thinking, logically substantiated knowledge on the basis of cause-effect relationships identification, observance of certain processes regulation in the general culture of humankind.

The central method of a new reality is becoming the method of analogy working on the basis of the similarity between real and virtual worlds. The method of analogy gives the chance to create a clear image of the new world on the basis of signs of two adjoining worlds and it promotes the simplification and its quantitative description. This method uses the analog of a real subject, phenomenon that adequately reflects the studied object on the basis of any sign of the similarity.

Therefore, the teacher has to learn to work at the level of figurative-art thinking (mythological consciousness), to operate images and to combine this when modeling the educational space with rationalism of the post-neoclassic period. As "Conclusions, inferences by analogy are not reliable, but are only probable to this or that degree. They rely on existing in the reality necessary links and relations between signs of the phenomena. The degree of conclusion probability by analogy is higher if more similar signs are captured and the more essential these signs of compared subjects are. If similar signs in the compared phenomena are casual, the analogy may be false. Due to their probabilistic character, conclusions by analogy have to be confirmed by results obtained by means of other methods and be carefully verified in practice" (Cit. by Orekhov, 2009. p. 321). The image is always richer, it reflects the original more precisely and contains more information on the object than a verbal description; that was in classical education. However the image may also contain more subjective, imagined. Therefore it bears in itself more danger for delusion that is inadmissible for an education system and training. The reason is that within virtual reality the selection of similar signs takes place on the basis of the rational analysis, and common sense since virtual processes occur so promptly that cannot be explained rationally.

The virtual image and the real phenomenon are comparable only by image, visually; to test a virtual image in practice is impossible. The available mistakes and delusions may be found only afterwards. Therefore modern education focuses the student on the formation of a new way of thinking of "a global network society", a new hybrid type of rationality that combines elements of intuition, guess, unconscious, common sense, ability of critical analysis, advancing thinking.

The person of an epoch of information society represents the world differently in comparison with the person of an industrial age. Modern science presents knowledge of separate fragments of the reality to the person. Information technologies make the person perceive world images where the access signal is "click". Therefore the world of the modern person "is torn apart" to multiple "fragments-slides". Each such situational fragment of reality acquires the outlines of a complete image. The person sees this mosaic reality as the text (narrative) and, taking fragments from the initial context, they build them anew so that they become in general free from any contexts.

Education is always focused on human's consciousness change. Modern education is oriented to teach the person to attribute semantic connotations to separate fragments-slides and to create personal space – the universe (the ordered world). The border of this world is defined by the person themselves. It is a new way of almost absolute spiritual freedom which received its realization through visualization in virtual images.

The fragmentarization of academic subjects takes place as a result. Large disciplines disappear, their places are taken more and more by multiple quasi-

disciplines. There is less time to master training material and develop future experts' certain competences, than they had with the application of traditional methods of training.

Manifestations of the aforesaid in education are distance education, virtual universities, communication on the Internet, e-mail, new forms of work with electronic texts, an inter-textuality, discourses within a global information network, etc.

CONCLUSION

The latest information technologies and specific mass media based on them have considerably transformed the modern person's life, have resulted in the change of the reality in which they stay. There has arisen a new active communicative field demanding to comprehend consequences. New mixed objective-virtual reality returns our consciousness to a mythological picture of the world, proposing to replace complete perception of the world with cosmocentrism with topocentric elements. It is, in fact, a humanized mixed world consisting of the unity of three components: virtual, objective and the border between virtual and objective. The part of this world is the person who lives on the border of these worlds.

Education is changing as well, it acquires new methodological objectives. It teaches the person not to separate virtual and objective realities from each other, to synthesize them in a united integrity; not to deny cause-effect relationship, and to carry out synchronous interrelation between form and content, cause and effect of the objective-virtual world; not to eliminate time in attempt to surpass it to comprehend the laws of virtual space-time being, to overcome its infinity; not to refuse the past, its determining force for the present, and to draw a logical line from the past to the future. The person acts as the main legislator, everything potentially depends on their will. All this demands from education to develop person's new abilities (Fahrutdinova, 2014) that will allow to make own choice in the solution of scientific issues; methodological competences aimed to provide learners' content-worldview support and personal space development where the person and the World are united in a syncretical image.

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