

# The Information and Communication Space of Education: Toward Digitalization

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## ABSTRACT

From the standpoint of the general philosophical idea of the contradictory nature of development, the idea of the information space and its impact on the educational process in the context of digitalization is investigated. An important feature established by digitalization in the relationship between the information space and the educational process has been set up. It is shown how the information space in the course of adaptation to digital realities transforms the direction of change into virtual space. The many-sided and multifaceted influence of digitalization on the educational process, including some psychological characteristics of students' perception, is emphasized. This article traces the influence of the updated information space on the deep processes of the human psyche, reorienting it from ideas inherent in the traditionally understood common sense of the possibility and reality, past and future, on the principles of virtual reality. A new problematic tendency is revealed, which unexpectedly appeared in the educational process. A new problematic tendency is revealed, which unexpectedly appeared in the educational process. It is caused by the diffusion of professional criteria required by the specialist, and, in this regard, the author made the necessary clarification of that part of it that most closely interacts with the educational process. Based on the fact of the information space transformation, the necessary clarification of that part of it that most closely interacts with the educational process has been made. Attention is focused on the fundamental difference between the electronic text and ordinary graphic. The electronic version can convey the encoded meaning not only in graphic terms, but, after necessary transformations, and in sound. In accordance with the accepted methodology to express the development process in its inconsistency, the article notes the positive and negative trends of the penetration of digitalization in the educational process. Among the positive ones is the possibility of a clear control of the acquired material; the responsibility arising from it for the implementation of the educational process and the habit of focusing only on oneself; the availability of diverse teaching methods focused on various students' psychological types; increasing visibility and involvement in the educational process (when it becomes possible to virtually personally test it), etc. We attributed the following to negative ones: the already identified problems of decreasing oral counting and handwriting skills, the desire to solve problems, not by our thinking, but looking for an answer on the Internet; the formation of various, most often - gaming, dependencies.

There has already been a clear danger of rapidly developing computer technology separation from legal and ethical regulations. In many countries, this danger is taken very seriously and resorted to such a protective measure as the creation of ethical codes for programmers..

**Keywords:** *information space, information, education, training, scientists, the science*

## 1. INTRODUCTION

The digitalization process [1] re-updated several seemingly already resolved problems, among which the concept of Information Space and its impact on various spheres of public life. We aim to study the influence of the information space on the educational process [2] since we believe that the essence of digitalization [3] to education consists precisely in the features of the information space. Information space can be viewed from two sides: substantial [4] and formal. In the first case, we will talk

about the definition, structure, features of individual elements of this concept. This is a big topic the article is about. On the formal side, in our opinion, a peculiar metric description of this phenomenon is possible when it is compared with itself at different times or in different states [5]. Before the digitalization, the main educational elements in higher education were teachers, students, normative documents, and educational literature. To “train” meant to ensure that students learn a certain amount of the skills and knowledge required by their speciality. In a manner, we can say that the speciality set all the required training parameters, was a self-sufficient spatial territory. The

speciality was not directly included in the structure of education but had the most active influence on it. Digitalization has brought innovations to all elements of the educational process, and perhaps the greatest of them is that the orientation towards the training of narrow specialists is a thing of the past. Many more recently, mass specialities have disappeared altogether or ceased to be such. On the other hand, many new ones appeared, some of which, having existed for a short time, had already disappeared. The peculiarity of the educational process's information space in the phase of digitalization, which is gaining momentum in a metric perspective, is as follows: in some cases, it turns out to be unknown either from the potential demand for future personnel or from the position of desirable competencies. It is created directly in the educational process, with constant correction with the progress of information technology and technical means [6]. For example, recently widespread penetration of digital technologies has been observed in medicine. The skills to master these achievements often go beyond the usual limits of the medical profession.

## **2. THE METHODOLOGICAL BASIS OF THE STUDY**

The methodological basis of the study was a general philosophical idea about the contradictory nature of the development and struggle of opposites as their driving force.

## **3. RESEARCH RESULTS**

The results of the study are expressed in three positions. 1. The extremely broad concept of information space is localized in the term machine information space. 2. Machine information space influences the deep processes of the human psyche, reorienting it from ideas inherent in traditionally understood common sense about the possibility and reality [7], past and future, on the principles of virtual reality. 3. Electronic content, even as a tracing-paper in comparison with it, brings in itself fundamentally new opportunities. For example, one can not only read it but also listen to it, not only perceive contextual semantic meanings but also empathize with them emotionally.

## **4. MAIN PART**

Let us discuss these results in detail. The concept of "computer information space" includes the devices with which programs work and technologies for various purposes, utilities, manufacturing companies, and part names. Add the names of wired and wireless networks and all the terminology used in them. An impressive list of terms will be obtained, without which it is impossible to talk about a computer information space, but at the same time, they do not express its essence. The essence is contained in the

program segment, known as software, text and graphic user files. These files create a virtual environment for the user, endowed with many opportunities, unthinkable in everyday life. The position expressed in the second result that machine information space has an impact on the deep processes of the human psyche and reorients it, relates entirely to virtual reality. However, equalizing virtual reality and virtual machine space is wrong. Virtual space is an integral moment of the perception of human consciousness and refers to those cases when the object acquires a leading value in the perception of the subject. At the same time, the physical nature of the object does not matter: it can be a very real task arising from everyday life or production; an object may be an individual phobia; finally, it may be the rules of the game in which the personality is involved. In all cases, the degree of involvement, perceived by the subject himself as the meaning of his being, is crucial. "Objects of the virtual level are generated by objects of the lower level, but, despite their status as generated, they interact with objects of generating reality as ontologically equal...in virtual reality, there are "laws of nature", their characteristics of time and space are irreducible to the laws, time and space of generative reality "[8]. A very important feature of this kind of virtual reality is that "Virtual objects exist only "here and now", while the processes generating them occur in the generating reality. The corresponding virtual objects disappear with the end of the generation process"[9]. A classification based on the commonality of their nature: physical reality, psychological characteristics, social conditions,.. machine virtual space allows bringing some order into the variety of virtual reality sources. A common natural basis creates a reproduction of similar phenomena that occur in seemingly different cases. So, television, cinema, theatre, painting, and other forms of figurative and artistic influence on human consciousness, at first glance, seem to be something independent and separate. Actually, the differences only concern the means of artistic expression, and the general way is to recreate virtual reality through imaginative representation. The possibilities of influencing the audience's mind utilizing artistic expressiveness are very great, up to immersiveness [10], readiness to accept these images as existing reality. And yet, the virtual reality of artistic images is not perceived as reality itself. The viewer can actively relive what he sees and empathize with the images, but he cannot actively influence them. Therefore, the artistically imaginative reality is classified only as "augmented," that is, as conscious along with everyday reality. As it turned out, there are two more steps for deeper immersion in virtual reality. The first is the ability to control machine reality. At this stage, a person recognizes the virtual environment as an adequate shell of his being, and realizes himself as its sovereign and master. The machine space opens up enormous opportunities for the user to realize his fantasies of transforming a virtual environment, elevates him in the idea of his supernatural abilities. On the stage of controlling machine reality, man, on the one hand, is not yet completely dissolved in the machine space, feels his individuality and the need to control this reality at his discretion. On the other hand, he already recognizes pseudo-reality as actually

existential, in which he feels himself a higher being. At this level, the dual state of a person in virtual space has received a contradictory expression in two opposite trends: an increase in the number of people dependent on the need to be in it constantly, and an official condemnation of this trend, up to the recognition of it as a disease. At present, the minority represents the first trend, but all these people have a positive experience of deep immersion in virtual reality. The second trend is supported by the vast majority, but it does not rely on a single evidence platform. Some have as much experience operating with a virtual environment as opponents while remaining in the realm of objective reality. But many opponents of excessive immersion in virtual reality judge this problem precisely because of the lack of such experience. Meanwhile, as practice shows, even at the highest phase of human involvement in the machine space, it has already produced impressive results. Studies of Russian high school students and students of one of the capital's universities revealed about 30% of gamers [11].

In Japanese men, the submission of virtual reality took a completely unexpected form. They are almost in droves trying to avoid sexual relations (in their terminology - lead a herbivorous lifestyle - A. Sch). They prefer films and games to real gender relations [12]. The highest phase of virtual involvement means the complete dissolution of the subject in it. This requires that all five senses perceive as reality what is generated by machine space. Already today many different devices successfully mimic the perception of the senses. As far as we know, the smallest progress is in imitating odors and taste. But over the next 3-5 years, a breakthrough is expected, and all available means of human perception will be used. The virtual environment will become indistinguishable from the original reality and, possibly, even more comfortable. The practical rapprochement of the two realities opens up enormous prospects for the progress of mankind. Existing teaching technologies can become not just an auxiliary tool for understanding the material being studied, but an incentive for the student's abilities exclusively through external influence. The use of technologies that involve all the senses will allow you to simulate (and in other cases level out) the stressful conditions of the body under simulated extreme conditions. The third result on the fundamental difference between file texts and traditional printed texts is observed at all stages of the information usage: copying, storage, distribution (transfer), processing (including localization by specified parameters), multi-formatting (text, sound, video, services, etc.). It is especially worth mentioning the specific compactness of the file format, which weights nothing and does not occupy any significant volume. File information can be shared as many times as you like without the slightest damage to the quality of the copied material. The file format has opened up enormous prospects in the form of distance education and its environment, which almost equalized full-time and distance learning. This makes it possible to equalize the chances of a full-fledged education between residents of different regions and social strata, but, more importantly in modern conditions, to retrain staff. A promising, but not yet studied topic: work at a remote location.

All these are unconditional advantages introduced by digitalization in the enrichment of virtual reality and the educational process in particular. In conclusion, informatization exerts a progressive, but not unambiguous influence on the educational process. The trends conducive to progress and development are discussed above; here will be named some problems. The effectiveness of computer-based learning control is accompanied by a decrease in students' analytical skills and a lack of proper practice in verbal argumentation. Older generations were perceived as carriers of practical experience and life wisdom in all sustainable societies before digitalization, but the successes of computerization have brought changes to this scheme. The technological advances in digitalization are more easily understood by young and educated people than by their parents and older relatives. In rapidly changing living conditions, the experience of seniors is significantly losing its value, and the successes of young people in mastering computer programs are too obvious. There is a dangerous tendency for the generation of students to overestimate the significance of their successes, in fact, in the utilitarian and entertainment field, and to accept them for the ultimate goal of education. Finally, the development of digitalization and technologies based on it are constantly ahead of the creation of legal and ethical regulations. The problem is not in low quantity. The problem is that they are essentially behind, do not capture, either do not adequately describe the changes that are taking place.

## 5. CONCLUSION

The article considers a problem that has not yet received a clear understanding in the scientific community. The advantages arising from the widespread adoption of the educational process are quite obvious. But it is possible, that exactly rapid progress in the development of information technology will not lead to irreversible changes in the essentials of man. After all, there is no guarantee that, under the guise of improving creative abilities, smart control devices, which can have an equally strong effect on his physical and mental inclinations, will never enter his body.

## REFERENCES

- [1] B. R. Barricelli, D. Gadia, A. Rizzi & D. L. R. Marini (2016) Semiotics of virtual reality as a communication process. *Behaviour & Information Technology*, 35: 11, 879-896, Taylor & Francis. <https://doi.org/10.1080/0144929X.2016.1212092>
- [2] Bozhko Y.V., Maksimkin A.I., Baryshev G.K., Voronin A.I., Kondratyeva A.S. (2016) Digital Transformation as the Key to Synthesis of Educational and Innovation Process in the Research University. In: Chugunov A., Bolgov R., Kabanov Y., Kampis G., Wimmer M. (eds) *Digital Transformation and Global*

Society. DTGS 2016. Communications in Computer and Information Science, vol 674. Springer, Cham. [https://doi.org/10.1007/978-3-319-49700-6\\_37](https://doi.org/10.1007/978-3-319-49700-6_37)

[3] Lyubova T.V., Gilfanova G.T. (2020) Scientific Researches Analysis in Digital Multitasking Field of Educational Process in Modern Universities and Determination of New Conceptual Boundaries of It. In: Antipova T. (eds) Integrated Science in Digital Age. ICIS 2019. Lecture Notes in Networks and Systems, vol 78. Springer, Cham. [https://doi.org/10.1007/978-3-030-22493-6\\_25](https://doi.org/10.1007/978-3-030-22493-6_25)

[4] John A. D'Ignazio, Joseph D. Ryan, Sarah C. Harwell, Anne R. Diekema, and Elizabeth D. Liddy. (2007). Examining perception of digital information space. In Proceedings of the 7th ACM/IEEE-CS joint conference on Digital libraries (JCDL '07). Association for Computing Machinery, New York, NY, USA, 479. <https://doi.org/10.1145/1255175.1255278>

[5] Guiqin Li, Zhipeng Du, Zhiyuan Gao, and Feng Chen. (2019). Ethics Education of Information and Big Data. In Proceedings of the 2019 International Conference on Modern Educational Technology (ICMET 2019). Association for Computing Machinery, New York, NY, USA, 96–100. <https://doi.org/10.1145/3341042.3341056>

[6] I.Sperano. 2017. Content audit for the assessment of digital information space: definitions and exploratory typology. In Proceedings of the 35th ACM International Conference on the Design of Communication (SIGDOC '17). Association for Computing Machinery, New York, NY, USA, Article 17, 1–10. <https://doi.org/10.1145/3121113.3121227>

[7] Opportunity and Reality [Text] / [Institute of Philosophy Ros. Acad. Sciences, Nat. society. scientific fund] // New Philosophical Encyclopedia: in 4 vols. - M.: Thought, 2000 -. - Bibliogr. in the note. at the end of the book.T. 1: A-D. - 2000 .-- S. 422-423.

[8] Virtual Reality [Text] / [Institute of Philosophy Ros. Acad. Sciences, Nat. societies. scientific fund] // New Philosophical Encyclopedia: in 4 vols. - M.: Thought, 2000 -. - Bibliogr. in the note. at the end of the book.T. 1: A-D. - 2000 .-- S. 403-404.

[9] Virtual Reality [Text] / [Institute of Philosophy Ros. Acad. Sciences, Nat. societies. scientific fund] // New Philosophical Encyclopedia: in 4 vols. - M.: Thought, 2000 -. - Bibliogr. in the note. at the end of the book.T. 1: A-D. - 2000 .-- S. 403-404.

[10] Chinello, Francesco & Konstantinos, Koumaditis. (2019). Virtual Immersive Educational Systems: Early Results and Lessons Learned. 1-2. <https://doi.org/10.1145/3355056.3364586>

[11] Lavrinenko S.V., Kivlenok T.V., Arpentieva M.R. (2019) Internet Addiction Disorder Among Russian Students of Technical Universities. In: Solovev D. (eds) Smart Technologies and Innovations in Design for Control of Technological Processes and Objects: Economy and Production. FarEastCon 2018. Smart Innovation, Systems and Technologies, vol 139. Springer, Cham. [https://doi.org/10.1007/978-3-030-18553-4\\_28](https://doi.org/10.1007/978-3-030-18553-4_28)

[12] Masahiro Morioka (2013).The Review of Life Studies Vol.4: 1-20 A Phenomenological Study of “Herbivore Men”. <http://hdl.handle.net/10466/12907>