DIGITAL PEDAGOGY: PROBLEMS AND SOLUTIONS

PEDAGOGIA DIGITAL: PROBLEMAS E SOLUÇÕES

PEDAGOGÍA DIGITAL: PROBLEMAS Y SOLUCIONES

Liliia V. VOLKOVA[1]
Larisa R. LIZUNOVA[2]
Iuliia A. KOMAROVA[3]

ABSTRACT: The article is dedicated to possible changes in the modern paradigm of education that presupposes a traditional model of activity in solving pedagogical problems. The main focus of the article is on two areas of scientific research: the disclosure of the deep meanings of "digital pedagogy" and the formulation of its main problems. The article presents the results of the study of psychological and pedagogical literature, which explains the interpretation of the new concept of "digital pedagogy" by modern Russian researchers. The article also analyzes the scientific literature explaining the problems of digital pedagogy identified on a variety of grounds, including the issues of insufficient quantity or poor quality of learning indicators, the need for the development of a teacher's digital culture, difficulties in the implementation of digital learning into the higher education system etc. The authors investigate the problems of digital pedagogy to define the essence of the concept and formulate its principles.

KEYWORDS: Digital pedagogy. Problems of digital pedagogy. Principles of digital pedagogy. Information society. Education system.

RESUMO: *O artigo se dedica a possíveis mudanças no paradigma moderno de educação que pressupõe um modelo tradicional de atuação na resolução de problemas pedagógicos. O foco principal do artigo é em duas áreas da pesquisa científica: a divulgação dos significados profundos da "pedagogia digital" e a formulação de seus principais problemas. O artigo apresenta os resultados do estudo da literatura psicológica e pedagógica, que explica a interpretação do novo conceito de "pedagogia digital" por pesquisadores russos modernos. O artigo também analisa a literatura científica que explica os problemas da pedagogia digital identificados por diversos motivos, incluindo as questões da quantidade insuficiente ou má qualidade dos indicadores de aprendizagem, a necessidade de desenvolvimento da cultura digital do professor, as dificuldades na implementação da aprendizagem digital no sistema de ensino superior etc. Os autores investigam os problemas da pedagogia digital para definir a essência do conceito e formular seus princípios.*

PALAVRAS-CHAVE: *Pedagogia digital. Problemas de pedagogia digital. Princípios da pedagogia digital. Sociedade da informação. Sistema de educação.*

[1] Perm State Humanitarian Pedagogical University, Perm – Russia. ORCID: https://orcid.org/0000-0002-1900-922X. E-mail: liv.volkova@yandex.ru
[2] Perm State Humanitarian Pedagogical University, Perm – Russia. ORCID: https://orcid.org/0000-0003-2624-2772. E-mail: larisa.r.lizunova@yandex.ru
[3] The Herzen State Pedagogical University, St. Petersburg – Russia. ORCID: https://orcid.org/0000-0003-2986-4446. E-mail: yuliakomarova@yahoo.com

***RESUMEN**: El artículo está dedicado a posibles cambios en el paradigma moderno de la educación que presupone un modelo tradicional de actividad en la resolución de problemas pedagógicos. El enfoque principal del artículo está en dos áreas de la investigación científica: la divulgación de los significados profundos de la "pedagogía digital" y la formulación de sus principales problemas. El artículo presenta los resultados del estudio de la literatura psicológica y pedagógica, que explica la interpretación del nuevo concepto de "pedagogía digital" por investigadores rusos modernos. El artículo también analiza la literatura científica que explica los problemas de la pedagogía digital identificados por una variedad de motivos, incluidos los problemas de la cantidad insuficiente o la mala calidad de los indicadores de aprendizaje, la necesidad de desarrollar una cultura digital docente, las dificultades en la implementación de la tecnología de aprendizaje digital en el sistema de educación superior, etc. Los autores investigan los problemas de la pedagogía digital para definir la esencia del concepto y formular sus principios.*

***PALABRAS CLAVE**: Pedagogía digital. Problemas de la pedagogía digital. Principios de la pedagogía digital. Sociedad de información. Sistema educativo.*

Introduction

In the 21st century, the education system has undergone serious structural transformations due to the development of scientific and technological progress and its impact on various areas of human life. The distance learning system has become an essential element of the transformations. The Russian educational community, on the one hand, intuitively felt the depth of the changes taking place, on the other hand, it consciously began to give out a response to them. A "splash" of reflection is observed every time a new phenomenon appears in education. It leads to forming polar judgments about the significance and effectiveness of a particular approach, new technologies, methods, means, techniques, etc. "At present, the number of information technologies used and introduced into the educational process reached a "critical mass" that generates in pedagogical circles a feeling of a revolutionary change in the pedagogical paradigm" (KALININA, 2018, p. 32).

The question of a possible pedagogical paradigm shift is significant for several reasons. We will review these reasons at the example of higher education. Firstly, based on the current scientific polemics, we can conclude the importance of the established paradigm as a traditional model of scientific activity in a certain period of time, as a set of theoretical, methodological and other attitudes presented by the pedagogical community at every stage of pedagogy development (KUHN, 2009; VOINOVA; PLESHAKOV, 2018). Secondly, the existing model of practical pedagogical activity extends constantly: innovations related to learning management system, special software for creating tests and various presentation materials, curricula include both online and face-to-face courses, recorded webinars and videoconferences

for repeated use, network access to electronic libraries, databases, scientific journals, etc. Thirdly, the discussion around the exponential growth of information and communication technologies in higher education in most cases allows levelling the terminological confusion and, as a result, methodologically correctly organizing and managing the educational process, as well as designing and conducting pedagogical research.

Even a cursory glance at the above reasons for the paradigmatic evolution allows us to conclude the following: due to the active introduction of information technologies, new circumstances have developed in the higher education system. Whether the situation implies a change in the pedagogical paradigm is difficult to answer unequivocally. At this point, it is only possible to designate two directions for analyzing the situation. The first direction is associated with the disclosure of the essence of pedagogy in the digital age (I), the second is connected with the identification of the main problems of digital pedagogy (II).

Materials and methods

The research material is the works of modern scientists published over the past decade on the problem of digital pedagogy. The main research methods at all stages of the study are the following: the phenomenological method for describing the results of the analysis of modern studies on digital pedagogy; the method of ascent from the abstract to the concrete to reconstruct the development process the new scientific concept of digital pedagogy and determine the subsequent research direction; a combination of such philosophical and general logical methods and techniques as aspect analysis of literature, systematization (synthesis) of ideas about changes in the modern education system, defining the term “digital” in modern pedagogy using comparison, comparison and correlation of the data obtained, their generalization.

Results and discussion

I. Definition of digital pedagogy

The term "digital pedagogy" has appeared relatively recently in pedagogical research. The crucial ideas of digital pedagogy and the questions of its inevitable development for the modern education system are discussed in the studies of such Russian scientists as P. N. Bilenko, V. I. Blinov, M. V. Dulinov, E. Yu. Yesenina, A. M. Kondakov, S. Sergeev (2020), Yu. A. Komarova (2014), O. S. Kryukova (2018), I. O. Petrishchev (2019), I. V. Sergeeva (2016) and others.

The authors of the "Didactic concept of vocational education and training" define digital didactics as "the science of organizing the learning process in a digital society" (BLINOV *et al*., 2020, p. 78), as "a branch of pedagogy, a scientific discipline about the organization of the learning process in a digital educational environment", emphasizing the fact that the subject of digital didactics is human activity (students' activity), not the functioning of digital education (BLINOV *et al*., 2020, p. 9).

Other researchers explaining the term "digital pedagogy" also highlight the primacy of "pedagogy" (in the traditional interpretation) and the complementarity of "digital" (as a means, a mechanism of innovative development of the educational process). They underline that

> at the moment, digital pedagogy assesses of the possibilities, advantages, effectiveness of digital technologies in education and at the same time it evaluates expected losses, diverse problems and even dangers associated with the lack of scientific approaches to widespread implementation of the technologies at all levels of education (SHESTAK; KRUTIY; KARNAUSHENKO, 2019).

According to I. V. Sergeeva (2016), "the essence of digital pedagogy is not so much the direct use of digital technologies in teaching, it is rather the use of these tools from the point of view of critical pedagogy" (p. 118).

Multiple other papers offer a different definition of digital pedagogy as a pedagogy that provides "high-quality education using computers and applications through the creation of new learning opportunities" (SMAPSE EDUCATION, n.d, p. 9). The same aspect of improving the quality of educational services by means of digital pedagogy is highlighted by I.O. Petrishchev (2019); he defines digital pedagogy as "a pedagogical process that includes various digital technologies (computers, gadgets, software, etc.) and, as a result, provides a higher quality of educational services" (p. 340).

The terms “digital pedagogy” and “online pedagogy” are often used as synonyms, however, this is not entirely correct since digital pedagogy is a broader research area that includes online pedagogy. O. S. Kryukova (2018, p. 310) emphasizes that

> digital pedagogy is attributed mainly to university education, while online pedagogy mostly characterizes technologies that are used both in higher and secondary schools. A “digital teacher” and a “digital student” in this logic have greater freedom in choosing a learning path than a school teacher and school student.

The analysis of multiple interpretations of the term allows us to conclude that the basis of digital pedagogy is traditional pedagogy, which uses modern digital technologies to achieve higher educational results. Thus, digital pedagogy can be defined as a pedagogy that studies and describes the pedagogical process based on new digital technologies used to ensure the education quality. The research focus shifts towards the quality of education and the problems of “digital pedagogy” (the difficulties that hinder learning achievements).

II. Modern problems of digital pedagogy

One of the problems of “digital pedagogy” is the formation of digital literacy, which is studied in many ways by various scientists. Thus, N.-Z. Legaki, K. Karpouzis, V. Assimakopoulos, J. Hamari (2021) raise questions of cognitive motivation through the possibilities of gamification. A. Justo-López, G. López-Morteo, B. Flores-Ríos, L.C. García (2021) explore the complexities to standardize the development of virtual learning environments and to unify efforts through mechanisms for interoperability. M. Pienimäki, M. Kinnula, N. Iivaricharacterise (2021) informal learning technologies as one of the ways to improve the quality of education (including “digital education”). They describe three main ways children and teenagers have fun in non-formal education: fun from the tasks they are doing, social fun by sharing with other attendants, and pedagogical fun that has been embedded in the learning process (PIENIMÄKI; KINNULA; IIVARI, 2021). R. Aurava, M. Meriläinen, V. Kankainen, J. Stenros (2021) analyze the format of the game jam in solving educational issues. S. A. Aderibigbe (2021) explores the correlation between the quality of students' learning and online discussions. The list can be extended by different aspects of digital problems and diverse tools for their solution. The general principle of research is basic: from the particular and singular to the general and universal, i.e., the tendency proceeds from a specific question to a wide range of tasks to be solved.

Ideas about the theoretical and empirical problems of digital pedagogy and their impact on the quality of education in general and higher education in particular are given in the works of such Russian researchers as E. V. Gnatyshina (2018), S. D. Ilyenkova, N. D. Ilyenkova, V. S. Mkhitaryan (2015), E. A. Pavlova (2019), I. O. Petrishchev (2019) etc.

Researchers also classify different aspects of the problems of digital pedagogy and offer multiple solutions to overcome them. For instance, some researchers (IlYENKOVA; ILYENKOVA; MKHITARYAN, 2015; etc.) assess the quality of education, which is a complex and multidimensional structure that can be described in several ways. On the one hand, the education quality can be characterized by the requirement for acquired knowledge in specific conditions to achieve a specific goal and improve the life quality. On the other hand, it is defined by a set of indicators, such as quality teaching staff, curricula, material and technical base, quality of students, quality of infrastructure, implementation of innovations etc. (IlYENKOVA; ILYENKOVA; MKHITARYAN, 2015). In that case, the subject of studies on digital pedagogy problems is indicators of education quality, diagnostics of the problems and possible ways to solve them, identification and assessment of difficulties, setting goals, developing and implementing the plans, programs, projects, road maps etc.

Other researchers and experimenters (GNATYSHINA, 2018; SHAUKHALOVA; YARYCHEV, 2019; etc.) suggest the main problem of digital pedagogy is the urgent need to form the digital culture of the teacher. To solve this problem, E. V. Gnatyshina (2018) offers a pedagogical toolkit to assist a future teacher. She highlights three stages of digital culture development in a professional-pedagogical information environment: the stage of identification, the stage of differentiation and individualization, the stage of personalization (GNATYSHINA, 2018, p. 48). R. A. Shaukhalova and N. U. Yarychev (2019) study the formation of the digital culture of bachelors and state that there is “the need to build a rich information and communication environment of the university” (p. 350).

Some scientists formulating the problems emphasize the totality of the implementation of digital learning into the education system. A. A. Verbitsky (2019) reveals the absence of a pedagogical or psychological-pedagogical theory of digital education. As a result, a significant part of the pedagogical staff (especially the older generation) consciously or unconsciously resists education digitalization. Secondly, he focuses attention on the destruction of the face-to-face communication between a teacher and a student. The primary role of teacher-student communication to form meanings, while “the computer is not able to turn information into knowledge” (VERBITSKY, 2019). As a solution to the problem, A. A. Verbitsky suggests

looking for psychological patterns and pedagogical mechanisms to understand this communication.

A significant group of researchers single out other problems of digital pedagogy. According to E. A. Pavlova (2019), these are the following issues: a long-term work with digital technologies (about 60% of the working time), insufficient equipment of educational institutions with computers, the increased financial burden of institutions, lack of digital learning practice, minimal personal contact with people, which provokes problems of personality socialization, etc. The solution to any of these problems requires severe systemic changes, adjustments and transformations.

To our understanding, such a problem of digital pedagogy as the search, formulation and substantiation of key pedagogical principles is as substantial as the ones described previously. At the current stage of the research, in addition to generally recognized principles of pedagogy (such as consciousness, activity, visibility, systematicity and consistency, scientific, accessibility), we suggest four principles of digital pedagogy. They are the following: the principle of personal development in lifelong education, the principle of permanent expansion of the possibilities of digital learning tools, the principle of cybersociality of education, the principle of total individualization.

The principle of personal development in lifelong education

The principle of personal development in lifelong education presupposes the fulfilment of the beliefs of humanism, mobility, flexibility, democracy, as well as the continuous and free self-improvement and self-development of the individual throughout life. This principle, according to L. V. Vygotsky (2001), leads to the creation of a social situation, which at the different stages of the learning process (especially at the level of higher education) raises the questions of the goal value and motivation for its achievement, the issues of goal-setting, expediency, purposefulness. The main point of the principle is to create the conditions for solving the described questions through the student's beliefs, views, convictions.

The principle of permanent expansion of the possibilities of digital learning tools

Another principle, the principle of permanent expansion of the capabilities of digital learning tools, is based on understanding the diversity of digital learning technologies. In higher education teachers already actively use a great variety of tools: organizational (software for videoconferences and webinars, information management systems and dashboards, etc.), educational (electronic manuals and libraries, online courses, etc.), practical (digital

laboratories Archimedes, Releon, Pasco, etc.). There are attempts to create digital learning services for higher education by analogy with educational portals for school students (Yaklass, Uchi.ru, Foxford, Multiurok, Infourok, 1C Education). The principle requires a regular update of higher education institutions' material and technical base and software, development of teaching staff digital culture, motivation of various subjects of an educational activity to use digital teaching aids.

The principle of cybersociality of education

Cybersocialityis defined as "a set of acquired personal qualities that ensure the ability to organize life in cyberspace to perform various social functions as a subject of network communities". Cybersocietyis considered as "a society of people organizing joint collective activities in both real and virtual spaces through modern information and communication technologies" (VOINOVA; PLESHAKOV, 2018). The essence of this principle is the organization of a students' dialogue in a constantly evolving cybersociety. This principle commands the organizers of digital learning to consider the multiplicity and diversity of human social functions in cybersociety. O. I. Voinova and V. A. Pleshakov (2018) list these functions: "to play certain social roles, skillfully change typical social masks, obey (or not obey) the requirements of public opinion, moral norms and legality", etc.

The principle of total individualization

In the traditional sense, the principle of individualization is familiar, it implies the development of each student through interaction with others. According to L. S. Vygotsky (1983, p. 170), this interaction should take place under the guidance of a teacher through the zone of proximal development to independent activity. "Totality" in this context means that the individualization of the teaching for each student occurs through the interaction with a computer program, digital teaching aids, a variety of electronic resources. The implementation of this principle requires the formation of students' morality (as digital tools focus on learning), the issues of conveying the meanings in teacher-student communication, questions of psychological development and socialization, etc. The levelling of difficulties is possible through dialogue both in the broad sense of this phenomenon and in the meaning of "direct conversation".

The problem of the basic requirements for the organization of the digital pedagogical process deserves special attention. On the one hand, it allows us to comprehend the

achievements of traditional pedagogical thought and, on the other hand, summarize the successes of modern pedagogical practice.

The subject of digital didactics is the activity of various participants in the educational process, not the functioning of digital educational tools. At this stage, digital pedagogy is open, developing, to a certain extent innovative complex of resources, conditions, opportunities for training, development, education, socialization of students. The pedagogical potential depends on the professional activity of representatives of the scientific community, teachers and the educational independence of students. In this regard, digital pedagogy requests the professional community for search, formulation, justification, experimental verification of patterns, postulates, principles of digital learning. Some problems of the scientific discussion on this topic are questions of who, how and when will satisfy this request, what digital tools should be used in teaching, how exactly they should be used, what new principles will determine digital didactics. Fundamental and applied research is needed to find answers to these questions.

Conclusions

Digital pedagogy studies and describes the educational process developed on new digital technologies ensuring the quality of education. The object of digital didactics is the process of training performed in a digital educational environment. Digital technologies significantly change the subject of didactics because learning takes place in various spaces, including network, augmented and virtual reality. Such aspects as self-study, design and development of an individual educational route and its mastering by students are brought to the fore. Notably, the variety of pedagogical functions of a teacher in the digital educational process continues to expand.

In modern digital didactics, the principles are being restructured to correspond to new conditions. Under the influence of digital technologies, as teachers gain experience, the teaching patterns are modified and improved. The disclosed principles determine the requirements for all components of the educational process: its logic, structure, goals and objectives, the structure of content, the choice of forms and methods of teaching, motivation, monitoring of results and their analysis. So far, one cannot speak of a certain concept of a digital didactic process, which can be represented as an internally consistent system. It is only possible to state the emergence of some new principles: the principle of personal development in lifelong education, the principle of permanent expansion of the possibilities of digital learning tools, the principle of cybersociality of education, the principle of total individualization.

The lack of a coherent theory of digital learning, as well as the omnipresent incorporation of digital technologies into traditional learning, establishes the importance of digital pedagogy principles. Complex multidimensional problems of digital learning require a scientifically based strategy for digitalization of education to maximize the use of digital tools and minimize losses associated with the development of students' social competence and moral character. It seems that the emergence of a new scientific strategy will ultimately initiate the mechanisms for changing the pedagogical paradigm.

REFERENCES

ADERIBIGBE, S. A. Can online discussions facilitate deep learning for students in General Education? **Heliyon**, v. 7, n. 3, e06414, 2021. DOI: https://doi.org/10.1016/j.heliyon.2021.e06414

AURAVA, R. *et al*. Game jams in general formal education. **International Journal of Child-Computer Interaction**, v. 28, 100274, 2021. DOI: https://doi.org/10.1016/j.ijcci.2021.100274

BLINOV, V. I. *et al*. **Didakticheskaya koncepciya cifrovogo professional'nogo obrazovaniya i obucheniya** [Didactic concept of digital education and training]. Moscow: Izdatel'stvo “Pero”, 2020. 98 p.

GNATYSHINA, E. V. Pedagogicheskij instrumentarij formirovaniya cifrovoj kul'tury budushchego pedagoga [Pedagogical tools for the formation of digital culture of the future teacher]. **Vestnik Chelyabinskogo gosudarstvennogo pedagogicheskogo universiteta** [Bulletin of the Chelyabinsk State Pedagogical University], n. 3, p. 46-54, 2018.

IlYENKOVA, S. D.; ILYENKOVA, N. D.; MKHITARYAN, V. S. **Upravlenie kachestvom** [Quality control]. Moscow: UNITI-DANA, 2015. 352 p.

JUSTO-LÓPEZ, A. *et al*. Process pattern and process capability evaluation model for interoperability in learning object environments. **Array**, v. 10, 100059, 2021. DOI: https://doi.org/10.1016/j.array.2021.100059

KALININA, S. D. Cifrovaya pedagogika: revolyucionnyj sdvig pedagogicheskoj paradigmy ili novoe videnie sovremennoj obrazovatel'noj sredy? [Digital pedagogy: a revolutionary shift in the pedagogical paradigm or a new vision of the modern educational environment?]. **Pedagogicheskie nauki** [Pedagogical sciences], n. 5, p. 32-36, 2018.

KOMAROVA, Yu. A. Metodicheskoe modelirovanie obrazovatel'nogo processa v vuze: metodologiya voprosa [Methodical modelling of the learning process in higher educational institution: methodological perspective]. **Vestnik Sankt-Peterburgskogo universiteta** [Saint Petersburg University Bulletin. Language and Literature], v. 2, p. 173-179, 2014.

KRYUKOVA, O. S. Tradicionnayai “cifrovaya” pedagogika v sovremennom obrazovatel'nom prostranstve [Traditional and “digital” pedagogy in the modern educational

space]. *In*: SBORNIKTRUDOV MEZHDUNARODNOJ NAUCHNOJ KONFERENCII, POSVYASHCHENNOJ 90-LETIYU S.P. KAPICY [International Scientific Conference dedicated to the 90th anniversary of S.P. Kapitsa], 2018, Moscow. **Proceedings […]**. Moscow: Russian New University, 2018. p. 310-316. Theme: Chelovecheskij kapital v formate cifrovoj pedagogiki [Human Capital in the Format of Digital Pedagogy].

KUHN. T. S. **The structure of scientific revolutions**. Moscow: AST, 2009. 605 p.

LEGAKI, N.-Z.; KARPOUZIS, K.; ASSIMAKOPOULOS, V.; HAMARI, J. Gamification to avoid cognitive biases: an experiment of gamifying a forecasting course. **Technological Forecasting and Social Change**, v. 167, 120725, 2021. DOI: https://doi.org/10.1016/j.techfore.2021.120725

PAVLOVA, E. A. Problemy cifrovogo obucheniya v obrazovanii [Problems of digital learning in education]. *In*: **Sbornik materialov Vserossijskoj nauchno-prakticheskoj internet-konferencii "Cifrovoe obrazovanie: problemy, puti resheniya"** [Collection of materials of the Russian scientific and practical Internet conference "Digital education: problems, solutions"]. Samara: Samara State College, 2019. p. 135-138.

PETRISHEV, I. O. Cifrovaya pedagogika kak faktor povysheniya kachestva obrazovatel'nyh uslug v RF [Digital pedagogy as a factor in improving the quality of educational services in the Russian Federation]. **Mir nauki, kul'tury, obrazovaniya** [World of Science, Culture, Education], v. 6, n. 79, p. 339-341, 2019.

PIENIMÄKI, M.; KINNULA, M.; IIVARI, N. Finding fun in non-formaltechnology education. **International Journal of Child-Computer Interaction**, v. 29, 100283, 2021. DOI: https://doi.org/10.1016/j.ijcci.2021.100283

SERGEEVA, I. V. Cifrovoj pedagog v onlajn obrazovanii [Digital teacher in online education]. **Nauchnye trudy Instituta nepreryvnogo professional'nogo obrazovaniya** [Scientific works of the Institute of Continuing Professional Education], n. 6, p. 117-122, 2016.

SHAUKHALOVA, R. A.; YARYCHEV, N. U. Cifrovaya kul'tura studentov bakalavriata kak konkurentnoe preimushchestvo sovremennogo specialista [Digital culture of undergraduate students as a competitive advantage of a modern specialist]. **Mir nauki, kul'tury, obrazovaniya** [World of Science, Culture, Education], v. 5, n. 78, p. 348-350, 2019.

SHESTAK, N. V.; KRUTIY, I. A.; KARNAUSHENKO, P. V. Cifrovaya pedagogika v uchebnom processe medicinskogo obrazovaniya [Digital pedagogy in the educational process of medical education]. *In*: TEZISY VSEROSSIJSKOJ NAUCHNO-PRAKTICHESKOJ KONFERENCII "ROSMEDOBR-2019/ROSOMED-2019" [Russian scientific and practical conference "ROSMEDOBR-2019/ROSOMED-2019"], 2019. **Abstract […]**. Sep. 10, 2019. Available at: https://rosomed.ru/theses/702. Access: 16 Mar. 2021.

SMAPSE EDUCATION. **Perspektivy razvitiya cifrovoj pedagogiki** [Expectations for the development of digital pedagogy]. n.d. Available at: https://smapse.ru/cifrovaya-pedagogika-bred-ili-surovaya-realnost/. Access: 16 Mar. 2021.

VERBITSKY, A. A. Cifrovoe obuchenie: problemy, riski i perspektivy [Digital learning: problems, risks and prospects]. In: **Elektronnyj nauchno-publicisticheskij zhurnal "HomoCyberus"** [Electronic scientific journal "HomoCyberus"], n. 1(6), 2019. Available at: http://journal.homocyberus.ru/Verbitskiy_AA_1_2019. Access: 17 Mar. 2021.

VOINOVA, O. I.; PLESHAKOV, V. A. Lichnost' i kibersocium: stanovlenie kibersocial'nosti i klassifikaciya lyudej po stepeni integrirovannosti v kibersocium [Personality and cybersocial: the formation of cybersociality and classification of people according to the degree of integration into the cyber society]. **Elektronnyj nauchno-publicisticheskij zhurnal "Homo Cyberus"** [Electronic scientific journal "Homo Cyberus"], n. 1(4), 2018. Available at: http://journal.homocyberus.ru/personality_and_cybersocium_formation_of_cybersafty_and_classification_of_people_according_to_the_extent_of_the_integration_into_the_cybersocium. Access: 17 Mar. 2021.

VYGOTSKY, L. S. **Sobranie sochinenij. T. 3. Problemy razvitiya psihiki** [Collected works. Vol. 3. Problems of the development of the psyche]. Moscow: Pedagogika, 1983. 369 p.

VYGOTSKY, L. S. **Lekcii po pedologii** [Lectures on pedology]. Izhevsk: Publishing House "Udmurt University", 2001, 304 p.

How to reference this article

VOLKOVA, L. V.; LIZUNOVA, L. R.; KOMAROVA, I. A. Digital pedagogy: Problems and solutions. **Revista on line de Política e Gestão Educacional**, Araraquara, v. 25, n. esp. 5, p. 3136-3147, Dec. 2021. e-ISSN:1519-9029. DOI: https://doi.org/10.22633/rpge.v25iesp.5.16003

Submitted: 13/03/2021
Required revisions: 23/07/2021
Approved: 19/11/2021
Published: 30/12/2021

Processing and editing by Editora Ibero-Americana de Educação - EIAE.
Correction, formating, standardization and translation.