INTRODUCTION

Russia’s transition to the innovative way of development is, firstly, inextricably linked to investments into human capital. This process has to become the national priority in theory and practice at all education levels. Change in the mental and physical labor culture became acknowledged; it became a challenge to key traditional ideas about a choice of profession, service to society, and collective creation. Professionals and workers of all qualification levels are now required to have high levels of quantitative literacy, serious scientific education, project thinking, digital competence, i.e., competences of the 21st century.

Society is gradually realizing the size of problems and speaking out diametrically opposed opinions about the evaluation of digitalization. The education system is one of the first that is forced to rapidly and flexibly adjust to this process, independently of the approved methodological framework, because such a one hasn’t been developed yet in pedagogical science. Let us remind that the state program “Development of education” for years 2013 to 2020 included the project “Modern digital educational environment” approved by the Government of the Russian Federation and geared to creating conditions for systemic quality improvement, broadening options of continuous education, and which already came to an end. By the force of events, it became seriously important to analyze gained experience accumulated by digital pedagogics during this time and systematize the educational results received in these circumstances in terms of effectiveness and quality. The obvious fact is that it was the education that was supposed to ensure a painless switch to the digital era, to arm the society with required skills and keep it in the certainty that investment of his intellectual and human capital into digital future will not pull it away from its historical and cultural, and national values of Russian civilization, and will provide it with further steady development.

This way, informatization and digitalization as historical and technological categories, through which the predicted patterns in the modern development of education and science are considered, require methodological re-thinking and systematization of notions, technologies, and management. The purpose of our research is a systematic analysis of scientific developments about the stages of development of the digital era, its impact on the educational environment in Russian and foreign practice. Hence the objectives of the research: to determine the methodological basis of transformational processes in education, to identify effective methods of digital pedagogy taking into account the needs of modern society, to identify the mechanisms of the impact of the information environment on students and to assess the readiness of the pedagogical and parent community to transition to digital forms of education and upbringing.

LITERATURE REVIEW

The notion of “informatization of society” can be defined as a global social process, the particularity of which lies in the fact that the predominant type of activity in the sphere of social production is gathering, accumulation, production, processing, transfer, and usage of information, that is performed based on the tools of microprocessor and computer technologies, and also based on various information exchange means. Concerning the educational sphere, the definition of “education informatization” was understood to be the complex of measures on transforming pedagogical processes on the ground of introducing
informational products, tools, technologies into training and education (ZHAO, LLORENTE, & GÓMEZ, 2021). Russian pedagogical encyclopedia considers informatization of education as a complex of socio-pedagogic reformations connected with saturating educational systems with informational products, tools, and technologies; in a strict sense – as the implementation of information tools, based on microprocessing technics, and also information products and pedagogical technologies, relying on these tools, into institutions of the educational system (IIVARI, SHARMA, & VENTÄ-OLKKONEN, 2020).

Thus, informatization combines in itself a whole range of interrelated processes:

- informational (segregation and representation of all socially important information in the form available for storage, processing, and transfer by electronic means);
- cognitive (formation and preservation of integral information model of the world that enables the society to perform pre-emptive dynamic control of its development at all levels: from an individual activity to functionality of social institutions);
- materialistic (building-up of a global infrastructure of electronic storage means, information processing, and transfer).

Premised on these conceptions, it’s possible to affirm that the informatization process is over, or in certain spheres, it’s near completion. Educational establishments of all levels are fitted with necessary multimedia equipment, and teaching staff went through professional retraining for getting the skills in information technologies. Academic and methodological complexes are packed with electronic training resources and means of visualizing training material. The next step should be the well-aimed acquisition of digital educational space with the help of these informational technologies. The notion of “digitalization” appeared due to the intensive development of information and communication technologies. German economist, the founder and irreplaceable president of the World Economic Forum in Davos K. Shvab, speaking about the history of the “fourth industrial revolution”, uses this notion quite actively.

In his work, he encourages all participants of the global community – governments, businesses, the scientific world, and the public – to close collaboration in acquiring innovative technologies. In his opinion, a uniform understanding of the global significance of digitalization is of fundamental importance for creating the mutual future based on the unity of goals and values. And for this, it’s required to have a scientific, complex, and unified understanding of how technologies change our life and the lives of future generations. And it’s hard not to agree with an expert opinion that the character of occurring changes is so fundamental that the world’s history didn’t happen to know such an era yet – both the time of great opportunities and potential dangers (MARTINENGO et al., 2020). A. Marei considers digitalization a change in communication paradigm and interaction with each other in society (MAREY, n.d.). E.L. Vartanova, M.I. Makeenko, S.S. Smirnova confirm this viewpoint by noticing that digitalization is not simply the conversion of information into digital format but a complex solution of infrastructural, managerial, behavioral, and cultural character. The main trend of Russian education is digitization (VARTANOVA et al., 2017).

According to expert opinion, the digital era focuses on increasing labor efficiency, a new typology of professional activity, and actualized human needs. This all utilizes the additional intellectual and labor resources and activates human life and activities’ stimulatory and motivational processes. In combination with aesthetic and spiritual needs, this leads the individual towards realizing the necessity of uninterrupted education, responsible alignment of individual educational routes, and the emersion of opportunity to manage your educational results independently. Transition into the digital era is followed by an uprise of virtual reality, which is, coming with certain risks, and methodologically established digital pedagogics aimed to protect a person from possible risks, to equip with all necessary tools so that to ensure oneself and society in the whole of informational safety.

The digital revolution, which seized the global economy, impresses by its speed and scale. If the passage from ECM to personal computers lasted for decades, then now, the technology breakthrough happens for one month, the software goes out of date fast, and then an already
new model of some device comes in sales. But the fact that digital technologies do not simply accompany economic development but also become a part of society’s cultural and political life puts people on guard. If the society is ready for this, and what the consequences of global digitization will be, are the actual questions that the scientific community is facing.

Nowadays, the number of workplaces where the executive is required to have a high level of general literacy and ability to solve tasks with the help of a computer markedly increased compared to the middle 90-s of the previous century. At the same time, the number of employees capable of fulfilling such work on a high level did not increase. Such changes have brewed in Russia as well. In the opinion of the rector of NRU HSE Ya.I. Kuzminov (2017), 15-20 years are needed, and serious outfitting of the Russian general education system is required to respond to this problem (MARTINENGO et al., 2020).

General education (how it’s already happening in economics and social life) will have to pass through digital transformation to solve the tasks that the fourth industrial revolution sets in front of education (EL-SAYAD IBRAHIM, 2021). The first industrial revolution established the mass school. The second one made it comprehensive, having improved the class-and-lesson system. The third one gave a textbook into everyone’s hands and led to compulsory secondary education. The fourth one introduces into life the personalized, result-oriented model of education. The main thing, which is happening in the digital transformation of education, is not the implementation of computer classes and connection to the Internet, but the formation and distribution of new working models for educational organizations. At the bottom of them, there’s the synthesis of new high-impact pedagogical practices, which are being successfully realized in the digital educational environment, continuous professional development of teachers, and new digital tools, informational sources, and services. For this, it’s necessary to create the organizational and infrastructural conditions for implementing necessary changes.

All of this induces the development of digital pedagogy itself, which is responsible for preserving the traditional priorities and at the same time creating a new model of the educational focus for digital teachers and online students. The notion of “digital pedagogics” itself made an appearance in foreign practice (“digital pedagogy”) and comprised the notion which is broader than “online” training. The gist of these pedagogical innovation studies lies in the intermediate usage of digital technologies in teaching and the employment of these tools from critical pedagogics. Let us remind that such a model of education cultivates another type of education process, where all participants get involved in socio-critical research. Together, they explore social reality under a critical angle of view and simultaneously participate in the collective creation of knowledge (NORTVIG et al., 2020). But Russian theoreticians see the transition from traditional class-and-lesson system to personalized-resultative learning as a basic task of digital pedagogy. In their opinion, the essence of digital transformation of education is in achieving necessary educational results and moving towards personalization of the educational process.

Of course, the statement saying that digital technologies help actually use new pedagogical practices, which earlier could not occupy the rightful place in mass education because of the difficulty of realizing them using traditional (paper) communication technologies, is not unquestionable. In our view, the printed book (textbook, manual, etc.) facilitates the child’s development much more effectively, rather than its electronic analog. This polemic in psychological and pedagogical studies has been going on till now. Agreeing that digital technologies arrange a world of possibilities for education improvement, it’s necessary to understand that integrating them into the educational process is far from easy. Researches of the “pre-pandemic” period, where a bright outlook of digitization in educational space was depicted, didn’t possess massive experimental data, which would prove the effectiveness of such technologies with apparent probability. But nowadays, behind the shoulders of all levels of the Russian educational system there’s the experience in distance learning, and psychological-pedagogical science will have to analyze much yet and make conclusions about the efficiency level of education digitization at such a pace.
MATERIALS AND METHODS
The methodological basis of the conducted research is represented by modern philosophical propositions about contradictory development of person and structure of his activities; general scientific principles of studying phenomena: scientificity, consistency, systematicity, objectivity, the connection of theory with practice; scientific research results related to motivation to execute the pedagogic activity for the development of schoolchildren’s social activity.

The research was done applying theoretical and empirical research methods. Theoretical methods are analysis of provision about teachers’ professional readiness for search activity; theoretical and methodological analysis which helped us define the initial research provisions; concept-based and terminological analysis; systematic analysis served for a holistic review of the problem. Empirical methods: study and systematization of teacher’s practices regarding the problem; observation, survey, questionnaire, and expert assessment method.

RESULTS
What is the essence of personalized education, and what are its advantages for modern Russian society? According to the monitoring results conducted in February 2021, regarding awareness degree in parents’ community of age group from 25 to 35 years, who have children of senior preschool age, about personalized education, we received the following scenery (Fig. 1).

Figure 1. Monitoring the parents’ awareness readiness regarding personalized education

![Figure 1](image1.png)

Source: Search data.

Figure 2. Monitoring parents’ willingness to pass to personalized education for their children

![Figure 2](image2.png)
More than 2000 representatives of the parents’ community took part in the experiment. The age of children is explained by the fact that this group will have to become familiar with all levels of the Russian education system soon. Parents have a higher or secondary (professional) education. Thus, the conclusion can be made that most of the population doesn’t even imagine what is ahead for their children in the future. The next stage of the experiment became informing the respondents about the notion and essence of personalized education; then the re-interview “Would you like your child to receive education of such type?” was held. The research results showed the ratio presented in Figure 2.

Hence, it becomes obvious that the facilities for unconditional transfer to those methodological models determined by digital modernization haven’t been created yet. The problem of personalizing education exists in Russian education, but it’s not new, and this all requires deep analysis and scientific rethinking. In our country, the practical study of opportunities peculiar to the personalized, resultative organization of the educational process is conducted still by separate groups of enthusiasts. The available works are of unit character and based upon certain teachers’ ambition to increase the performance of training activity (MARTINENGO et al., 2020). Experience shows that this is a lengthy and arduous process, for the success of which the following circumstances are needed: a developed digital environment, the readiness of pedagogical staff to work in this environment with minimum time consumption and data processing, students’ high motivation, parents’ comprehensive support, and taking into account the regional cultural and educational environment and its specific character.

The other problem of digital pedagogics is that the development and distribution of new cultural digital tools brought up a question related to the intellectual and psychical capabilities. There is a need to develop them in the traditional organization of the educational process based on social interaction and collaborative practice. Another question is about which of these capabilities can be compensated with new digital informational tools. But it’s worth understanding that the new cultural tools are at the stage of establishing and development, and along with that, they are already actively used in educational practice, despite didactic narrowness and violation of information security. Concerning this, forming a unified, safe, and the multifunctional digital educational environment becomes one of the main tasks of digital pedagogics as a new scientific sector of pedagogical innovation studies.

But a certain stage in creating digital educational space has already been walked through. It’s characterized by the invention of the Unified collection of digital educational resources (ZOR) (DRUZHIKINA et al., 2020). The federal project “Informatization of the Education System” resulted into its introduction. Presently, this project comprises more than 100,000 digital educational resources practically on all subjects of the basic education plan. Teachers of all stages in general education can use these resources, which contain modern training materials, electronic editions, digital collections, and encyclopedias. Among the suppliers filling up this portal, there are universities, museums, scientific organizations, cultural institutions, publishing houses, and representatives of the real sector of the economy. All of this allows us to conclude that the information comes from competent official sources. The project of the Federal center for informational and educational resources continued this work. Thus, about 12,000 electronic training modules, created for general education, and more than 5,000 modules targeted at professional education, were systematized. A single window of access to information resources was developed. This provides free access to the catalog of educational internet resources and full-text electronic learning and teaching library for general and professional education. It’s important that it united the access to digital resources stored at federal and regional educational portals. In connection to this, all learning and teaching complexes started to get equipped with electronic versions, multimedia manuals, and visual materials. The Federal center for informational and educational resources represents the central storage area of electronic educational resources of the new generation.

The next essential step became the realization of the Russian Electronic School project, the gist of which was to launch the market of digital educational resources (making of video lessons), which became the substantial support for teachers in organizing distance learning in
March-May 2020. In the same context, it’s necessary to consider the future available PDF textbook and teaching-learning literature versions. Such tendencies led to establishing the unified electronic educational systems throughout the country, the first of which became, of course, the metropolitan idea of founding the consolidated information system “Moscow electronic school” (2016) with electronic grade books and school diaries, electronic document flow systems, and electronic reference databases. Thus, it became obvious that the educational process is getting open and public for all participants of educational relationships, including the parents’ community and constituent bodies. The existence of official websites, strictly structured according to specific regulations for every educational institution, becomes the obligatory requirement of licensing and state accreditation processes. Such work was held more effectively in the higher education system, the creation of an electronic educational environment, mobile and multifunctional one. It became the obligatory requirement to organize the educational-bringing-up process in a higher educational establishment. By this time, such specialized program products as “Parus VUZ”, “1C: university PROF”, and the system of individual courses management “Moodle” became available. Such platforms allow the accounting, storage, processing, and analysis of information about the basic processes of higher education institutions. This relates to all stages of students’ activities, payment for studies, graduation and graduate employability, and also calculation and distribution of academic teaching staff’s course load, operations of curriculum and instruction departments, support of federal state educational standards for all-levels training (bachelor’s degree, specialist, master degree, doctoral candidates). The given systems help upload study plans and nationally recognized graduation documents, render accounts, and manage the scientific work. Such program products make arrangements for the technical aspect of synchronous and asynchronous interaction, stipulated in the majority of Federal State Educational Standards of High Education, by providing students and professors’ personal accounts.

In the focus of attention of digital pedagogics, there is also a question about education quality evaluation. Nowadays, multifunctional digital platforms ensure the objectiveness of analyzing this process. The first large-scale usage of such educational resources became the information accompanying the Unified State Exam. In this regard, the unified state official portal of the Uniform State Examination (EGE) was founded. The Uchi.ru online platform was one of the first to be launched for approbation. The platform allows teachers and students to work in the mode of asynchronous communication both during the lesson and off the lesson. Interactive tasks, offered on the platform, align with the school program. Hence, a high degree of its effectiveness was proved when used for students’ homework in the 5-7 grades: the mistakes are highlighted at once, learning tips are given, the real-life situations are simulated there. It’s worthy acknowledging that Uchi.ru is a typical example of a commercial solution in general education. There are similar educational initiatives: Mobile electronic school, also offering educational services for trainees and teachers; Open school, providing training and correction materials, which align with educational programs on chemistry, physics, maths, history, literature, and other school subjects. Nowadays, the platforms, approximating the personalized methodologies, also attract attention: Foxford is a Russian online school that offers online courses and tutors for students of 3-11 grades, preparation for Unified State Exam (EGE), Basic State Exam (OGE), and olympiads. For students of 5-11 grades, the Home school and external studies of Foxford are also operating; they include online lessons with the individual program and a personal supervisor. Students can also register with one of Moscow schools-partners so that they can take the end-of-course assessment. Among online educational projects, which are gaining popularity, is the LECTA educational platform, which, since 2016, has been providing payable access to any electronic textbook. The NAVIGATUM Portal is unique because it performs the career guidance work and gives an opportunity to students through its video films and cartoons presented in a language understandable for students of different ages to learn about their future profession as much as possible; the idea and role of labor in modern society, and the importance of having professions which are much in demand in modern society. We would also like to mention the leading Infourk (info lesson) educational portal, established for teachers. It provides the opportunity for qualification upgrade and professional training and presents as a professional platform for research and methodological communication, supporting parents.
and students. In conditions of developing a continuous education system, all participants of the education process have to join the process of professional improvement and acquisition of competencies, which is new for them. Internet-resource INTALENT PRO helps develop the individual educational route independently, the path of professional upgrade, gives support to students and their parents regarding the questions of selecting future profession.

In recent years, the formation of automated intelligent educational systems (AISO) is one of the innovative directions in solving the difficult tasks of managing the cognitive activity of trainees, targeted at increasing their level of self-organization and self-education with continuous reduction of teacher’s participation. AISO, based on artificial intelligence, helps gear the education process to the trainees’ individual peculiarities. Applicable to the sphere of passing the block of knowledge to the generation of school children, the potential of AI appears immensely wide. The maximum expectations from the effect of using AI in the educational process are connected with the creation and implementation of:

- innovative teaching methods;
- new forms of knowledge generation (intellectual expert systems based on BigData);
- new knowledge communication channels based on the AI programs in dialog systems;
- new forms of presenting information focused on visualization;
- new forms of controlling the understanding of learning materials taking into account the participants’ individual characteristics in the educational process.

As an example of using a principally new approach in education, it’s worth mentioning the implementation of British AI-platform Century Tech in educational organizations of the Flemish region in Belgium. This platform uses teaching methods and solutions and utilizes the basic principles of neurophysiology for identifying schoolchildren’s inclinations, level of knowledge and endurance, tempo and suitable time for studies, and speed of information passage from short-time memory into long-time memory. Afterward, the mentioned analytics is incorporated into the machine learning algorithms. It’s estimated that AI will help adjust lessons according to each student’s individual characteristics.

Using AI in national education can be demonstrated through Russian start-up Parla, which uses the app for learning the English language. The app is based on the program, learning together with students and adjusting to their tasks and progress. When students are signing in to the app, the program can analyze social nets data and suggest the individual training program based on personal interests.

In the era of society informatization and the beginning of the commercial application of neural networks, it is also worth using such a trend of digital transformation of the educational space as the introduction and implementation of Artificial general intelligence (AGI), capable of thinking and acting like a person, and possibly having significant similarities with them. Currently, such a criterion is the interface implemented in dialogue systems such as Siri and anthropomorphic robots. It is worth noting that an anthropomorphic robot or advanced AI that can substitute a teacher is no longer a technocratic fantasy but a reality. For instance, the Alantim robot is the development of the Perm scientists at the Promobot company. The robot teacher acts as a deputy head of the department at the Technological Institute of the Moscow Institute of Technology, gives lectures on robotics to students, and conducts large-scale research on the interaction between people and smart machines.

CONCLUSION

As a result, the digital education space comprises a range of educational resources, which have proved themselves as reliable partners in accompanying teaching and learning processes for school children and students of higher education institutions in the last years. The introduction of automated intelligent educational systems into the educational process will increase training effectiveness due to the possibility of minimizing the human factor and rationalizing the search for an individual, differentiated approach to each student. In addition,
it will free the teacher from routine tasks and provide more opportunities for realizing his own and the student’s potentials. And still, we’ll emphasize the importance of preserving the traditional system of giving lessons when there is live interactive communication of students, a teacher in the process of receiving the knowledge and achieving personal and subject-wise results of education.

REFERENCES

DRUZHININA, O.V., IGONINA, E.V., MASINA, O.N., & PETROV, A.A. Aspects of using prototyping and artificial intelligence technologies in the frames of digital transformation of educational process. *Modern Informational Technologies and IT-Education*, 2020, 16(1), Mar. p. 50-63. Available at: https://doi.org/10.25559/SITITO.16.202001.50-63. Access: June 14, 2021.

EL-SAYAD IBRAHIM, S. A. Educational Platforms and Digital Transformation in Raising Awareness about Remote Education in Light of the Corona Epidemic Spread Among Secondary School Students. Journal of Southwest Jiaotong University, 56 (1), 2021, p. 358-376. https://doi.org/10.35741/issn.0258-2724.56.1.33. Access: June 14, 2021.

KUZMINOV Y.I. How to make schoolchildren successful. Vedomosti. 21.011.2017 [Electronic resource]. Available at: https://www.vedomosti.ru/opinion/articles/2017/11/21/742459-shkolnikov-uspeshnimi. Access: March 15, 2021.

LIVARI, N., SHARMA, S., & VENTÄ-OLKKONEN, L. Digital transformation of everyday life - How COVID-19 pandemic transformed the basic education of the young generation and why information management research should care? *International Journal of Information Management*, Vol. 55, Dec. 2020, art. 102183. Available at: https://doi.org/10.1016/j.ijinfomgt.2020.102183. Access: June 14, 2021.

MAREY A. Digitalization as a paradigm shift [Electronic Resource]. Available at: https://www.bcg.com/ru-ru/about/bcg-review/digitalization.aspx. Access: March 18, 2021.

MARTINENGO, L., YEO, N. J. Y., MARKANDRAN, K. D. O., OLSSON, M., KYAW, B. M., & CAR, L. T. Digital health professions education on chronic wound management: A systematic review. *International Journal of Nursing Studies*, Vol. 104, Apr. 2020, art. 103512. Available at: https://doi.org/10.1016/j.ijnurstu.2019.103512. Access: June 14, 2021.

NORTVIG, A.-M., PETERSEN, A. K., HELSINGHOF, H., & BRÆNDER, B. Digital expansions of physical learning spaces in practice-based subjects - blended learning in Art and Craft & Design in teacher education. *Computers & Education*, Vol. 159, Dec. 2020, art. 104020. Available at: https://doi.org/10.1016/j.compedu.2020.104020. Access: June 14, 2021.

VARTANOVA E. L., VYRKOVSKY A. V., MAKSEENKO M. I., & SMIRNOV S. S. Russian media industry: digital future: academic monograph. Moscow: MediaMir, 2017.

ZHAO, YU., LLORENTE, A. M. P., & GÓMEZ M. C. S. Digital competence in higher education research: A systematic literature review. *Computers & Education*, Vol. 168, Jul. 2021, art. 104212. Available at: https://doi.org/10.1016/j.compedu.2021.104212. Access: June 14, 2021.
Digital transformation of educational space: historical and technological approach

Resumo
A sociedade moderna tem a necessidade de uma análise sistemática dos processos inovadores que abrem uma nova era digital no desenvolvimento da sociedade. O objetivo do artigo foi analisar os pré-requisitos históricos, genéticos, científicos e técnicos para a transformação digital da esfera educacional na prática russa e mundial; determinar os fundamentos metodológicos dos processos de transformação na educação; identificar métodos eficazes de pedagogia digital considerando as necessidades da sociedade moderna. Métodos de pesquisa: análise teórica e metodológica, o que possibilitou identificar posições iniciais de pesquisa; análise conceitual e terminológica; métodos empíricos: observação, levantamento, questionário, método de avaliação de especialistas. São necessárias as seguintes condições para o desenvolvimento do ambiente digital na educação: o desenvolvimento de indicadores digitais do conteúdo das competências universais do professor, o apoio da comunidade de pais, o material e equipamentos técnicos das instituições de ensino, as novas ferramentas de informação digital.

Palavras-chave: Digitalização. Transformação. Personalização. Espaço educacional. Recurso de informação.

Abstract
Modern society has a need for a systematic analysis of innovative processes that open a new digital era in the development of society. The purpose of the article was to analyze the historical, genetic, scientific and technical prerequisites for the digital transformation of the educational sphere in Russian and world practice; to determine the methodological foundations of transformational processes in education; to identify effective methods of digital pedagogy considering the needs of modern society. Research methods: theoretical and methodological analysis, which allowed us to identify the initial research positions; conceptual and terminological analysis; empirical methods: observation, survey, questionnaire, expert assessment. The following conditions are necessary for the development of the digital environment in education: the development of digital indicators of the content of the universal competencies of the teacher, the support of the parent community, the material and technical equipment of educational institutions, new digital information tools.

Keywords: Digitalization. Transformation. Personalization. Educational space. Information resource.

Resumen
La sociedad moderna tiene la necesidad de un análisis sistemático de los procesos innovadores que abren una nueva era digital en el desarrollo de la sociedad. El propósito del artículo fue analizar los requisitos previos históricos, genéticos, científicos y técnicos para la transformación digital de la esfera educativa en la práctica rusa y mundial; determinar los fundamentos metodológicos de los procesos de transformación en educación; identificar métodos efectivos de pedagogía digital considerando las necesidades de la sociedad moderna. Métodos de investigación: análisis teórico y metodológico, que permitieron identificar las posiciones iniciales de investigación; análisis conceptual y terminológico; métodos empíricos: observación, encuesta, cuestionario, método de evaluación de expertos. Las siguientes condiciones son necesarias para el desarrollo del entorno digital en la educación: el desarrollo de indicadores digitales del contenido de las competencias universales del maestro, el apoyo de la comunidad de padres, el material y el equipo técnico de las instituciones educativas, las nuevas herramientas de información digital.

Palabras-clave: Digitalización. Transformación. Personalización. Espacio educativo. Recurso de información.