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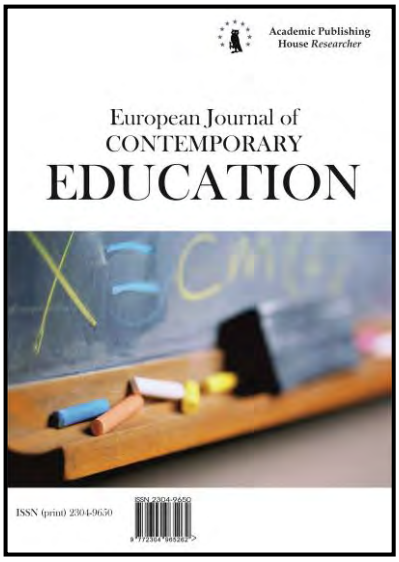

Digitalization of Education in Modern Scientific Discourse: New Trends and Risks Analysis

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Abstract

The paper presents the results of systematic review of modern scientific publications devoted to the digitalization of education. A review of Russian and foreign studies allows us to conclude that there is a relationship between high academic performance of students and the use of digital technologies. Other advantages of digitalization are: expanding the boundaries of "self-directed learning", developing leadership in the pedagogical environment, creating conditions for the formation of individual educational trajectories of students, modernizing tools for assessing student knowledge, and also differentiating forms and methods for teaching. Based on a critical analysis of publications on this topic, the possible destructive consequences of digitalization of education are determined: ousting experienced teachers with insufficient digital competence from the educational space; information overload; an increase in cognitive distortions; a decrease in the effectiveness of training regarding the formation of interpersonal communication skills of students; the deepening of digital divide; the formalization and dehumanization of education.

Compensators of educational space digitalization dysfunctions are distinguished: improving the teacher training and motivating system, digital content quality control, taking into account the regional specifics of educational systems, a combination of traditional and digital pedagogy, group collaboration, and digital trust. The paper substantiates the conclusion that digital technology is a necessary, but at the same time, insufficient condition for improving the quality of educational work and morale building activities. Based on the analysis of scientific publications, the authors determine the principles of digitalization of education: the formation of institutional conditions for supporting digital innovations, the consideration of situational factors, the resource support of educational organizations, and the priority of personal interests (subject-centered approach).

Keywords: digitalization of education, information and communication technologies, digital trust, digital literacy, digital pedagogy, digital technologies.

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1. Introduction

The development of digital technologies, the formation of digital economy elements ensures the competitiveness of the state, increasing the level and quality of life of citizens, economic growth and modernization of the social sphere.

Digital technologies are part of a new knowledge infrastructure that is now steadily integrated into everyday life. This knowledge infrastructure is "a reliable network of people, artifacts, and institutions that generate and maintain the informational resources necessary for humans" (Edwards, 2010). For the new generation of "digital natives", the Internet is becoming not just a source of information, but also a sphere of entertainment, a field for acquiring new skills, improving one's skills, and building a career (D'yakova, Sechkareva, 2019).

Digital technologies in the modern world are becoming more and more influential participants in professional and educational practices. As in the case of the industrial revolution of the 19th century, the intensive development of information and communication technologies changes the specifics of activities in many areas of public life (Fenwick, Edwards, 2016). On the one hand, risks and threats of loss of professional identity, dehumanization of society are being formed, on the other hand, new opportunities are opening up for increasing the level of competence, developing the individual's creative potential, and modernizing forms and methods of training.

Digitalization of education is an integral part of the training of a modern specialist. These trends are associated with a repeated increase in the importance and volume of information, and an increase in the number of interdisciplinary research and projects. Surveys show that students today realize the need to increase their competence in the field of artificial intelligence, processing and analysis of big data, information and communication technologies (Mahova et al., 2018). The transition to a digital society imposes fundamentally new requirements both to new competencies of specialists and to the process of forming these competencies (Chekanov, Neizvestny, 2019). The education based on innovative future breakthrough technologies increases the "market value" of a specialist in the labor market (Buryak, 2018). In this regard, the need for the introduction and analysis of new approaches in the education system, the transformation of existing forms, methods and technologies of training is becoming particularly relevant (Short, Korobicyna, 2019).

The importance of social networks, virtual reality technologies, and Internet applications for modern youth encourages educators to use information and communication technologies for educational purposes. However, according to research results, the assessment range for the "usefulness" of digital technologies has a high level of differentiation among educators. On the one hand, there is an understanding of the advantages of digitalization, the needs of young people in the development of digital competencies, and, on the other hand, there are ideas about the need to confront "an overwhelming optimism regarding digital technologies" (Menashy, Zakharia, 2019).

A critical analysis of international scientific discourse made it possible to establish a shift in the focus of attention of scientists to consider the advantages of introducing digital technologies into education (Bicen, Uzunboylu, 2013; Tamim et al., 2011; Hew, Cheung, 2013; Tess, 2013). In particular, a review of Russian and foreign studies allows us to conclude that there is a relationship between high academic performance of students and the use of digital technologies.

Along with this, in the scientific literature there are also works that analyze the problems of digitalization of education and their possible destructive consequences. In the modern scientific discourse, the risks are considered where the "live communication" practice between a teacher and a student disappear, and there is the need to analyze the "feasibility" of the active use of information and communication technologies, taking into account the pedagogical context; situational factors affecting the successful integration of digital technologies in the educational space are emphasized (Burnett et al., 2019; Van den Beemt et al., 2019).

2. Materials and methods

The debatable positions on the issues concerning digitalization of education actualize the need for scientific understanding and review of scientific literature, and the results of empirical research on this topic. A systematic analysis seems to be necessary both on the advantages of introducing digital technologies into education, and on the possible risks associated with its destructive factors. The interdisciplinary nature of the processes involving digitalization of education is driven by the complexity of their study within the scope of a subject field of the single

science. The modernization of pedagogical practices, the transformation of the teacher's role determines the need for a scientific analysis of these processes within the framework of sociological, psychological, philosophical and pedagogical approaches.

The purpose of the paper is to analyze the conceptual foundations of digitalization of education within the modern scientific discourse, to consider its substantial characteristics, to study new trends, advantages and risks of introducing digital technologies into the educational space, as well as to identify factors that increase the efficiency of these processes. An additional task is to comprehend certain aspects of digitalization presented in the scientific literature: the impact of digital technologies on the quality of education, the readiness of subjects of the educational space to introduce digital technologies, the transformation of models of interaction between a teacher and a student in the digitalization conditions.

For analysis, scientific articles published after 2010 were selected. The total sample of sources amounted to 125 articles. Articles were excluded from the sample, the content of which was based on well-known theses; the results were not distinguished by significant novelty. In addition, articles that indirectly related to the introduction of digital technologies in education and/or did not reveal new trends, advantages, and risks of digitalization of education were excluded. The final sample was 84 articles.

Databases for searching for scientific articles: Web of Science, Taylor & Francis Online, Springer Link, SAGE Publishing, Cyberleninka.ru

Search Keywords for Scientific Articles: information and communication technology, digital technology, digital pedagogy, digital learning, online learning, electronic contexts (Table 1).

The methodological core of the analysis consists of theoretical research methods, in particular, a review analysis to the study of factors and trends in the digitalization of education, the introduction of information and communication technologies in the educational space, and a generalization of conceptual provisions presented in modern foreign and domestic publications.

Table 1. Key studies included in the in-depth review

Author, date, country	Srudy type	Purpose	Content/ Key findings	Methodology
Selwyn i dr., 2019 (Australia)	New trends	This article addresses the deliberately speculative question of 'What might the school of 2030 be like?', with a specific focus on the influences of digital technologies.	The article considers the increasing prevalence of dataveillance, digital deskilling and the de-territorialization of schooling. The article then goes on to consider changing relationships between time/place, material and coded structures, as well as the increasingly platformized and data-driven nature of schooling in the 2020s.	The article adopts the methodological approach of 'social science fiction' to explore the ways in which digital technologies might be used in one Australian high school in 2030 (Lakeside), and what this might mean for the people whose lives are enmeshed with these technologies.
Lacka, Wong, 2019 (USA)	New trends	The current study examines the use and outcomes of computer-based instructional technology in the context of graduate business education. Case study data is gathered to explore how computer technology is used in the university classroom, and how computer-based teaching methods differ from traditional teaching methods in terms of class interaction and in-class	The use of computer-based teaching methods requiring hands-on student use appear to offer an advantage over traditional methods and over computer-based methods not requiring hands-on student use in providing a forum for exploratory analysis during class and for acquiring technical procedural knowledge. A model of in-class learning is developed for future	Research examining classroom use of computers consists almost exclusively of experiments examining a specific application of a computer-assisted instruction, a videodisk, or an interactive video. Research on computer-assisted instruction {CAI)

		learning.	research.	
Hawkins i dr., 2019 (USA)	New trends	Studying the impact of digital learning games. In particular, it explores how different images of scientists in an evolutionary learning game can influence motivation.	The results show the importance of further exploring the impact of digital learning games on student motivation.	The author's methodology was based on ranking respondents by gender and age. A distinctive feature of the methodology is the inclusion of participants aged 9-10 years. The method of paired comparisons was used.
Martin i dr., 2019 (Spain)	New trends	Conduct a diagnostic assessment of the level of knowledge possessed by prospective teachers of preschool education in relation to concepts related to ICT.	The main conclusion is that these future teachers had virtually no theoretical knowledge of technology. Therefore, universities should be one of the main institutions responsible for conceptual learning, so that future specialists in the field of preschool education can successfully integrate ICT into their educational practices.	The authors used a quantitative methodology, using an online survey method to collect data, as well as descriptive and logical methods of data analysis. The sample included 332 students in their first year of pre-school education at the University of Salamanca (Salamanca campus), predominantly female (98.6 %), and ages ranged from 17 to 24 years.
Ilina et al., 2018 (RU)	New trends	To study the nature of the transformation of the social status of University teachers during the socio-economic reform of the country and the modernization of higher education.	A significant tightening of the University's requirements for teachers and increased competition in the professional sphere was revealed. The development of skills in the digital environment can become a compensator for the decline in the social status of the teacher.	Three-stage sociological research with the participation of 274 teachers and 215 students of the Russian state social University (RSSU) for 7 years (2009–2016).
McLay, Renshaw, 2019 (Australia)	New trends	Membership categorization analysis (MCA), to examine how a group of young people creates a collective identity in interaction.	The article contributes to a growing body of research that engages with more nuanced ways of understanding contemporary, technology-mediated learning as a process of producing not only knowledge and skills, but also selfhood-both private and shared	We consider the sense of self-awareness and collective identity of young people in connection with their use of specific digital tools available in their school. A detailed analysis of the MCA conversations in the group interviews. Analysis of relational speech acts.
Fenwick, Edwards, 2016 (UK)	New trends	This article aims to examine the impact of digital technologies on professional practice at the individual, organizational, national and international levels.	To date, despite the introduction of many professional codes on the use of digital data and social media, these issues have received limited examination in research addressing professional education. This article aims to explore some of these trends, how they are manifested in different professions and what might be the educational implications. Our argument is that new digital technologies are reconfiguring	The methodology is not selected as a separate block in the abstract of the article. According to the results of the study, there is reason to believe that one of the key research methods is the analysis of documents, statistical and informational data sets.

			professional practice and responsibility, but that the education of professionals has yet to adequately reflect these changes. Digital technologies may therefore be changing the governing of practice rather than simply enhancing the efficiency of practices.	
Buryak, 2018	An analysis of the advantages	The article analyzes the problems of educational support for the strategy of digitalization of the Russian economy.	The author substantiates the conclusion that the successful implementation of the state program of digitalization of the Russian economy requires the support of the higher education system on "disruptive technologies".	The analysis of scientific sources on the research problem is carried out. A comparative analysis of various points of view on the contribution of higher education and digital training technologies to the strategy of digitalization of the Russian economy is used.
Bicen, Uzunboylu, 2013 (Turkey)	An analysis of the advantages	The purpose of this research is to find out how Facebook and Web 2.0 tools create a positive effect when used in education and to investigate teachers' opinions about the Online learning environment.	Results show that, if used for educational purposes, Facebook could bring about a positive change in teachers' opinions. Results also indicate that Facebook virtual environment helps teachers to do many activities with online classes, which is not possible to do in schools. Teachers are convinced that this environment helps students not only to improve their team work, but also to improve their learning skills. Based on the findings, recommendations are made about using Facebook in education.	This experimental study was carried out in primary and secondary schools with teachers who use Facebook. The study took six weeks and 30 hours. The teachers attended lessons and accessed materials online and offline, in face-to-face learning environment. The study sample consisted of 35 teachers from primary and secondary school who constituted a blended learning group and 36 teachers from primary and high school who formed an online learning group that enrolled in the material development for Facebook course. Data was collected using a 5-point Likert scale questionnaire created by the authors and entitled "Teachers' Opinions about Facebook in Education". The questionnaire consisted of 39 positive statements about Facebook. It was completed by teachers at the beginning (pre-experience test) and the end of the study (post-experience test).
Tamim i dr., 2011 (United Arab Emirates)	An analysis of the advantages	Addressing the question, does computer technology use affect student achievement in formal face-to-face classrooms as compared to classrooms that do not use technology.	Insights about the state of the field, implications for technology use, and prospects for future research are discussed.	This research study employs a second-order meta-analysis procedure to summarize 40 years of research activity. A study-level meta-analytic validation was also conducted for purposes of comparison. An extensive literature search and a

				systematic review process resulted in the inclusion of 25 meta-analyses with minimal overlap in primary literature, encompassing 1,055 primary studies. The random effects mean effect size of 0.35 was significantly different from zero. The distribution was heterogeneous under the fixed effects model. To validate the second-order meta-analysis, 574 individual independent effect sizes were extracted from 13 out of the 25 meta-analyses. The mean effect size was 0.33 under the random effects model, and the distribution was heterogeneous.
Hew, Cheung, 2013 (Saudi Arab)	An analysis of the advantages	This study is aimed at identifying the impact of technology in the classrooms for Saudi students at Midwestern University.	The study reached the following main results: - The use of technology in the educational process is very useful if used well, as the student. - This type of study can help educators understand the effects of different factors on student preference for learning devices.	To achieve this goal, the researcher conducted a survey on a group of graduate students in Saudi Arabia who are studying in small universities in the Midwest in the United States. The survey inquiries from students, the type of technology used in their studies in Saudi Arabia, how they helped them teach, and how technology changed from their university level in Saudi Arabia to their graduate level in the United States.
Tess, 2013 (UK)	An analysis of the advantages	This paper summarizes the scholarly writings as well as reviews the findings of empirical investigations. Some limitations are discussed, and future areas of research are proposed.	Many scholars argue for the purposeful integration of social media as an educational tool. Empirical evidence, however, has lagged in supporting the claim. Most of the existing research on the utility and effectiveness of social media in the higher education class is limited to self-reported data (e.g., surveys, questionnaires) and content analyses.	The analysis of scientific works and empirical studies of the practice of using social networks and digital technologies by higher school teachers is carried out. Methods of generalization, systematization and analysis of data sets are used.
Detyna, Kadiri, 2019 (UK)	An analysis of the advantages	Study of the practice of using virtual reality technology in training	The findings are in line with those of previous studies which show that immersive VR (Virtual Reality) environments create a strong sense of perceived presence which leads to higher learner engagement and motivation.	Inductive approach to thematic analysis Three trial runs of full earth simulations in VR (virtual reality) in classroom environments were conducted using high-end VR (virtual reality) hardware
Klochkova, Sadovnikova, 2019 (RU)	An analysis of the advantages	The purpose of the research is to analyze current trends in education in the context	The analysis made it possible to determine the main trends in the field of education. The identified	Methods of descriptive statistics are used. The analysis of information collected during a

		of digitalization.	trends proved the need to improve the quality of education using information and communication technologies. The results of the study demonstrate the demand for specialists in the field of information and communication technologies in the labor market, including among people with disabilities.	sociological survey organized and conducted by the faculty of the Department of statistics in conjunction with the ANO "Council for management and development" at the Department of labor and social protection of the population of Moscow is presented. Data visualization methods are used for visual representation of data. Data processing was performed using MS Excel and the IBM SPSS Statistics application package.
Aleshkina, Apokina, 2019 (RU)	An analysis of the advantages	The article aims to study the current trends in the development of various spheres of society due to the active use of information technologies.	The development of the digital economy and digitalization of most sectors of human life is reflected in the need for retraining, professional development of employees, changes in working methods, and sometimes radical changes in the sphere of activity. These processes require the attention of an individual, an enterprise, and the entire state	The authors used qualitative research methods: analysis of scientific sources, government programs, and statistical data.
Craciun, Bunoiu, 2019 (Romania)	An analysis of the advantages	Analyze how ICT-based formal and non-formal activities incorporating digital comics and other visuals can facilitate learning and can increase student enthusiasm/motivation for learning science.	The use of visuals and ICT, in particular, of digital comics, can be a suitable medium/method for science education and communication for this young generation	In the case of preservice teachers, the study involved the application of an in-house questionnaire (CH1), both before and after the didactic activities, which was completed with a focus group at the end of the activity. Post-test and a quasi-experimental design without a control group was used to investigate the perception of secondary school students on the usefulness of digital comics in their science education and ICT integration in learning activities.
Van den Beemt i dr., 2019 (Netherlands)	Analysis of the limitations	The current literature review aims to present a synthesis of conditions and outcomes relevant for a well-considered, evidence-based use of social media, and teacher professional development.	Reported factors include school culture, attitude towards social media, support, teacher professional development, learning goals and a clear position in the curriculum. Considerations and advice for educational practice were formulated.	The review included 271 articles, which were analysed with framework synthesis.

Ma, Vachon, 2019 (Taiwan)	Analysis of the limitations	The aim of the study is to find an answer to the question whether national income, political freedom, and national investment in research and development (R & d) and secondary education are linked to the second digital divide.	R&D spending reduces the socioeconomic gap in educational software use only in low-income countries. Educational expenditures reduce the Internet literacy gap in high-income countries while exacerbating it in low-income ones. Additional analyses suggest that income inequality increases the digital divide, but like political freedom, the effects become non-significant when national income is considered.	Using data from the 2009 OECD Programme for International Student Assessment, we consider two aspects of the second digital divide for 15-year-olds across 55 countries: the gaps in use of educational software at home and Internet literacy.
Manikovskaya, 2019 (RU)	Analysis of the limitations	Search for an answer to the question: how digitalization, which is transforming the modern world, changes relations between people, and how it can transform a person (morality, ethical norms).	The risks and negative consequences of digitalization of human relations are presented. Last seen in possible the dehumanization and instrumentalization of education, distortion of identity, disintegration of the pieces and even to "digital man", the devaluation of traditional moral norms and principles, leading to the destruction of the moral foundations of society, which in the public mind has always been associated with strength, firmness of the foundations rooted in the joint being consciously advocated.	Analysis of moral and ethical relations, reflection on the role and place of morality and morality in the problematic context caused by digitalization.
Noskova i dr., 2016 (RU)	Analysis of the limitations	The main purpose of the article is to answer the question how transform existing pedagogical theories and practices in an electronic environment.	It is concluded that educational practices in the electronic environment should be subject-centered, with a high degree of interaction, collaboration, and teamwork. They should be transformed in the cognitive, motivational, and regulatory aspects in order to enrich the activities of educational subjects by expanding the range of educational tasks and spatial and temporal boundaries. Such educational practices are an important component of the process of conscious independent development	Methods of analysis and comparison of domestic and foreign pedagogical theory, practice, using the results of a survey of students in the framework of an international study in the field of e-learning in higher education institutions.

Gupta, Irwin, 2016 (USA)	Analysis of the limitations	The study was conducted to examine Facebook (FB) as a distraction in the classroom.	Participants were more susceptible to FB distractions when the primary learning task was of low-interest. The study also found that goal-relevant FB intrusions significantly reduced HI lecture comprehension compared to the control condition (A). The results highlight the need for recourses that will help educators increase student engagement with their learning task. Implications for future research are discussed.	This experiment fills a gap in the literature by manipulating lecture interest-value and controls for duration of FB exposure, time of interruption, FB material and the order of FB posts. One hundred and fifty participants were randomly allocated to one of six conditions: (A) no FB intrusions, high-interest (HI) lecture; (B) no FB intrusions, low-interest (LI) lecture (C) goal-relevant FB intrusions, HI lecture (D) goal-relevant FB intrusions, LI lecture (E) goal-irrelevant FB intrusions, HI lecture (F) goal-irrelevant FB intrusions, LI lecture.
Dobrinskaya, Martynenko, 2019 (RU)	Analysis of the limitations	The purpose of the research is to study the specifics and trends of the formation of the information society in Russia by analyzing various aspects of its digitalization, including those related to the task of reducing the digital divide — a new form of social inequality based on the development of information and communication technologies in the second half of the twentieth century.	The article draws conclusions about the prospects for bridging the digital divide in Russian society and identifies the risks and negative consequences of attempts to accelerate its digitalization.	The method of analysis of statistical data and data from empirical research in 2015-2017 was used. The three-level division of the digital divide is used as a methodological basis for analyzing digital inequality, where the first level records the difference in access to the latest information technologies. The second level of the digital divide captures the difference in skills required for effective use of information technology. The third level is life chances and opportunities due to the use of information technologies.
Kozlova, 2019 (RU)	Analysis of the limitations	The purpose of the article is to determine the main directions a digital transformation that radically changes the economy, education, and lifestyle in General.	It is established that digital technologies for the educational process – a necessary but insufficient condition for improving the effectiveness of educational work. It is concluded that the transition to a new model of educational process organization requires the use of high-tech organizational, pedagogical and methodological solutions.	The research methodology is not specified. However, the study of the materials of the article allows us to conclude that the author uses episodes of systematization, generalization, and analysis of documents. The data from the original author's research is missing.
Kohanova i dr., 2019 (RU)	Analysis of the limitations	The purpose of the study is to determine the trends of the current stage of digital education development. Special	The key trend is the transfer of traditional training methods to the digital environment. At the same time, such risks	Questionnaire survey of 286 students of journalism faculties of Moscow Universities.

		attention is paid to the issues of Internet risks and threats that arise for communicators when working with social networks.	as content risks, communication risks, consumer and technical risks are high. it is established that Internet addiction as a consequence of the development of digital technologies is also gaining momentum.	

3. Results

3.1. Conceptual Characteristics of Digitalization of Education

The study of the problems concerning the transition from computerization of education to its digitalization is of particular relevance. A comparative analysis of these processes makes it possible to more reasonably approach the issues of determining the essence and content of the "digitalization of education" concept. A number of studies highlight the following informatization characteristics: the use of automated data banks, distance learning resources, fragmented use of information and communication technologies in the processes of knowledge transfer and assessment (Strekalova, 2019). In contrast to these characteristics, the basis of digitalization is the widespread introduction of electronic resources and digital technologies in pedagogical practice, which opens up wide opportunities for the formation of students' competencies. In particular, digital education is inextricably linked with the possibilities of using electronic content, electronic educational environment, social media, virtual reality technologies, and open information systems (Kohanova et al., 2019). In contrast to informatization, digitalization involves a transition from the simple use of information and communication technologies to the systemic modernization of the educational space based on digital technologies, the formation of "digital maturity" of teachers and students (Badykov, 2018). So, within the context of digitalization, the forms of information transfer from a teacher to a student are changing. The range of pedagogical forms is expanding significantly, including not only presentation materials, illustrations or videos, but also direct connections to information networks, databases, and integration into network communities (Petrova, Bondareva, 2019).

As E.Yu. Levina stresses, digitalization is becoming a continuation of informatization by strengthening it with the transition of many functional processes exclusively to the virtual sphere, and expanding it with the possibilities of consolidating information and communication, mobile technologies and global information resources (Levina, 2019)

In the process of digitalization, the content and structure of training, approaches to the organization of the educational process are radically changing (Safuanov et al., 2019). Particular attention in modern studies of the digitalization of education is given to virtual reality technologies. E. McGovern considers their role in shaping the soft skills of students, in particular, such as participating in public speaking, business negotiations and communication, and preparing presentations. In addition, virtual reality technologies allow students to self-evaluate their skills, to see the direction of their development, and to adjust training programs (McGovern et al., 2019). Complementing this study, M. Detyna and M. Kadiri highlight the benefits of using virtual reality technologies such as higher student engagement and motivation (Detyana, Kadiri, 2019).

T.N. Noskova's (Noskova et al., 2016) point of view deserves special mention in the process of analyzing current trends in digitalization and its key semantic components. As part of this study, new educational practices have been identified that show the direction of modernization of education in the context of digitalization. Summarizing the scientific literature on this issue, we can distinguish the following elements of digitalization:

- Online teaching;
- Tutor's support in the process of mastering knowledge;
- Use of electronic educational content;
- Interactive methods for the development of students' competencies and the formation of their skills;
- Digital technologies for knowledge assessment;

• Digital technologies for monitoring and managing an educational organization (learning management systems, network organizers, testing systems, etc.).

• Network horizontal communications, both between subjects of the educational space, and between organizations;

• Virtual learning environments and social networks, and also robotization (Lacka, Wong, 2019);

• Digital learning games (Hawkins et al., 2019).

Gamification methods deserve special attention; they are considered as a key factor for increasing interest in learning within the context of digitalization (Vinichenko et al., 2019; Demchenko et al., 2018). Networking and collaboration are one of the central elements of digitalization. They include the creation and implementation of projects, the exchange of not only information, but also resources and experience. The conditions for the exchange construction are trust (Rogach et al., 2018), cooperation, and infrastructure support of self-organization processes. Within the framework of network interaction, an "activity contact" is formed between the participants; that forms a new systemic quality (Simonova, Dvornikova, 2018).

The analysis of key trends and characteristics of "digitalization of education" in comparison with "informatization of education" allows us to draw a number of conceptual conclusions. The lack of a clear distinction between these concepts leads to a distortion of the performance evaluations for the introduction of digital technologies. The focus of attention by the heads of educational organizations is shifting towards increasing digital resources (video lectures, presentations, content), using elements of distance learning and/or digital presentation of learning outcomes (electronic diaries). These practices are the essence of education informatization, while digitalization involves a transition to a qualitatively new content of the educational process (the use of virtual reality technologies, interactive methods, horizontal network connections, etc.)

The increased attention of the authorities to the introduction of digital technologies in education is orienting universities and schools to step up their positions in this area. However, given the weak technological base and insufficient level of readiness of the pedagogical community, these practices do not provide the required performance, while sometimes leading to destructive consequences and imitation of activities. For example, in many universities, teachers are required to develop electronic content for their courses or even present videos of their lectures. As part of the implementation of the E-School project, these requirements also extended to school teachers who are motivated to digitize their materials, to place lesson scripts in an electronic environment, etc. It should be noted that a simple transfer of printed texts into electronic format cannot be considered as a meaningful description for digitalization of education.

An increase in an additional burden on teachers shifts the pedagogical work vector in the direction of decreasing the fraction of the time allotted for close and "live" interaction with students. A teacher is more focused on formal criteria for the quality of the educational process: timely preparation and placement of digital content, and work in an electronic environment. Excessive intensification of pedagogical work and organizational pressure from the leadership of educational organizations interested in the rapid introduction of digital innovations in the educational process initiate negative trends such as imitation of activity, increased anxiety, stress, and professional burnout.

The sharp changes in educational practices in the context of digitalization form new requirements for the teacher's computer literacy and their skills in the digital environment. This issue is especially acute for teachers of the older age group. Limited access to continuing education systems and tutor support may be an additional risk factor for expelling from the educational space of the experienced teachers, who do not have the appropriate level of computer literacy.

3.2. New trends in the development of education in the context of digitalization

In the context of digitalization, it is natural to change the traditional models of interaction between key subjects of the educational space. The availability of electronic resources and videos of the best lecturers in the world, the emergence of automatic translation of texts and speech from any language creates new challenges for the education system and, in particular, for teachers (Safuanov et al., 2019). The following questions become the center of the scientific discourse: what are the functions and role of a teacher in the context of digitalization; what should be the subject of evaluation; what should be a new form of the lesson/lecture/seminar? If a teacher was the key figure in the educational process as a relay of knowledge earlier, this role loses its relevance in the context of digitalization.

Fundamental is the evolutionary shift of education forms from cognition (the "knowledge" paradigm of education) to constructive creation (the "cognitive" paradigm of education). Under the new conditions, student's 'competencies are seen as readiness and ability to take specific actions, and they are the result of each period of "building up" their knowledge (Levina, 2019). The growth in the scale and importance of intellectual and creative activities (Efimov, Lapteva, 2018; Ilina et al., 2018) set a new vector for the modernization of the educational sphere.

In modern conditions, approaches to the organization of the educational process in universities and schools are changing. Experts today express fears that leading universities may lose their leading position, their place will be taken by network providers of educational services.

In addition, questions on transformation of the identity of young people in the context of digitalization are of interest. Modern training based on digital technologies is a process of production of not only knowledge and skills, but also self-awareness, and personal values (McLay, Renshaw, 2019). Digitalization has a significant impact on the norms of informal communication. Informal digital practices are changing patterns of communication and collective action in the face of social and academic inequality. The expansion of the boundaries of social interaction and the emergence of new forms of self-presentation form new alternative identities of students (Timmis, Munoz-Chereau, 2019). In this regard, the risks of increasing the distance between new generations of students and the teaching staff increase (different value systems, world views, lifestyles, ways of learning) (Efimov, Lapteva, 2018).

3.3. Digitalization Benefits

The integrated implementation of information and communication technologies in schools is a key factor in empowering students. Pedagogical observations demonstrate the potential of digital technologies in the field of knowledge modeling, updating existing knowledge control tools, and ensuring transparency of assessment results for students (Campelj et al., 2019).

Considering informal digital practices of students, S. Timmis and B. Munoz-Chereau consider that digital technologies enrich collective activity, contribute to the development and strengthening of social, cultural and educational capital (Timmis, Munoz-Chereau, 2019). According to a number of researchers, the boundaries of leadership are expanding for teachers in the context of digitalization; the basis for the development of their authority in the process of school management is being formed (Berry, 2019).

The active implementation of digital technologies ensures a high-quality modernization of the training content, and also meeting the needs, interests and expectations of all subjects of the educational space (students, teachers, and employers) (Klochkova, Sadovnikova, 2019). Information and communication technologies can increase the intensity of the educational process, and ensure the personal development of students in the context of dynamically changing labor market requirements (Aleshkina, Apokina, 2019). The introduction of digital technologies allows students to be not only consumers of electronic resources, but also their creators (Ahmetzhanova, Yur'ev, 2018).

The actualization of the student's constructive position is ensured by setting personal educational goals, choosing learning paths, constructing the content of educational activities (Pac, 2015; Ahmetzhanova, Yur'ev, 2018), focusing on project activities, and developing "soft" student skills (Moskalyuk, 2019).

For the most part, the analysis of the advantages of digitalization of education represented in foreign scientific literature includes the study of the links between the formation of specific skills (for example, competencies in the field of information literacy) and the use of certain digital technologies (Takacs et al., 2015; Mills, 2010). Also of interest are studies that reveal the positive factors of using social networks in the learning process: cooperation (Shraim, 2014), flexibility, the ability to build individual educational paths (Kohtz et al., 2012).

Based on empirical data collected at public and private universities located in Delhi (India) and its environs, S. Paul and K. Lal conclude that the use of digital technologies contributes to the development of students' creativity, improves their learning abilities, and increases academic performance. The results of their research illustrate students' opinions on the advantages of using digital technologies: "they contribute to a clearer understanding of the material; they are a better illustration of ideas; they provide the opportunity to communicate with students, and ensure that education meets international teaching methods" (Paul, Lal, 2018).

Digital technologies allow us to radically change the content and form of the material and to reduce the level of routine in learning. Direct connections to databases, forums, and virtual reality simulators can differentiate educational services, overcome unification, and increase interest in learning (Nguyen, 2019). Information and communication technologies open up even more significant advantages for management systems of educational organizations, transferring them to a new technological level (Timofeeva, Shapoval, 2019).

The development of these ideas is presented in the work by P. Short. Based on the results of the use of digital technologies, the use of online platforms and online systems in the field of education in the Tambov region, conclusions were drawn by him about the positive trends in the content of educational and research work of both students and teachers, providing them with the conditions for forming their own "educational route". A new scheme for obtaining knowledge in an interactive intellectual environment provided ample opportunities for the exchange of experience and information contributed to the formation of project competencies, and the ability to develop and implement non-standard management solutions. An additional advantage of using digital technologies was the high level of differentiation of training and provision of each student with an individual teacher, whose role was played by the computer (Short, Korobicyna, 2019). Similar findings were obtained in other studies examining the specifics of using artificial intelligence in the field of education and its role in the talent management system (Vinichenko et al., 2019). Paskova A.A. emphasizes that artificial intelligence technologies provide the development of personalized e-learning while minimizing teacher involvement (Paskova, 2019). This is especially true for the educational space where digital technologies occupy a dominant position, for example, within the framework of distance learning, and additional professional education. Information and communication technologies create the foundation for the implementation of the continuing education trajectories, which is especially important in the dynamic labor market conditions. Further training of a functioning specialist actualizes such advantages of digitalization as the ability to work at a personal pace, in a convenient mode and according to a convenient schedule (Bojchenko, Smirnova, 2019).

O.V. Bojchenko and O.Yu. Smirnova connect the advantages of digitalization of education with overcoming the spatial-temporal boundaries in training. Digital technologies allow persons to access high-quality educational services, regardless of where they live, and also to remotely exchange data. In the context of regional differentiation both between and within countries, these advantages of digitalization reduce the risks of social inequality, allow a person to become a competitive specialist, to study at leading educational organizations, and to unlock their creative potential (Bojchenko, Smirnova, 2019).

Experts emphasize in their studies the discovery of new opportunities that digitalization provides for young people, in particular children from poor and low-resource families. The development of digital technologies ensures the growth of social inclusion in the field of education. Achievement of these goals is possible under the conditions of overcoming such restrictions as language barriers (more than half of educational resources use English, which does not allow most Russian children to find, understand, and use the necessary educational content), and lack of digital skills (Pryazhnikova, 2018). Analysis of these limitations allows us to formulate a research question. Besides the advantages, what are the risks of introducing information and communication technologies into the educational process?

3.4. The destructive effects of digitalization

The gap in the digital skills of young people, formed on the basis of their socio-economic status, is defined as the second digital inequality. Gaps in the use of educational software and inadequate digital literacy have been identified in a number of countries among low-income groups (Ma et al., 2019).

According to experts, the digitalization of society will contribute to the development of social inequality. These destructive trends are due to the increasing requirements for skills, human skills in the new digital reality. The condition for obtaining high-tech competencies is the availability of financial resources (Manikovskaya, 2019). Achieving digital literacy is one of the key factors in the competitiveness of a modern specialist in the labor market.

The international scientific discourse raises the question of the need to match digitalization trends and the needs, interests, and socio-psychological characteristics of the new digital generation. At the same time, not only objective transformation of values, educational motivation

of the new generation, but also existing information threats and addictions should be taken into account (Noskova et al., 2016).

Negative learning outcomes in the process of using digital technologies were often associated with risks of an "effect of distraction" from educational goals, and a decrease in concentration of students' attention (Gupta, Irwin, 2016; Junco, 2015).

The observations of educators on the "digital natives", which are young people born in the era of virtual reality, indicate a significant transformation of their values, lifestyle and skills. The digitalization of education reinforces these trends and often excludes competences related to interpersonal communication and creativity from the focus of educators (Cladis, 2018). The specificity of the lifestyle of modern schoolchildren in digitalization conditions is its multitasking mode, information overload, and the presence of numerous gadgets. Such a digital background does not contribute to the development of cognitive skills (Kryukova, 2018; Vinichenko et al., 2018).

An interesting analysis of the digitalization risks is presented in the work by N.B. Strekalova: lack of cognitive competencies of students, a decrease in the level of training, a loss in the fundamental nature of education, a decrease in the need for highly intelligent specialists, a decrease in the number of personal contacts between a teacher and a student, information overload, an increase in the requirements for the psychological stability of a teacher (Strekalova, 2019).

A significant increase in the volume of disseminated information leads to "information overload" which is manifested in cognitive distortions, impaired memory and attention. Zero cost of information storage, the ability to quickly access it at any convenient time does not contribute to remembering even important material, and also forms a dependence on numerous electronic devices. Such dependence, in turn, contributes to the loss of many personality skills (Dobrinskaya, Martynenko, 2019).

The main dysfunctions of the digitalization of education within the framework of the philosophical approach include the following: dehumanization, formalization of the learning process, deformation of a person's identity, devaluation of moral norms (Manikovskaya, 2019).

3.5. Factors Enhancing Digitalization

Analysis of the risks and threats of digitalization of education focuses scientists on the search for strategies and factors that optimize the implementation of digital technologies. These include the following aspects: changing stereotypes of the organization of the educational process in the digital educational environment; creation of a system of compulsory training and retraining of a teacher; optimization, adaptation and digital transformation of the content of the main professional educational programs (Bogoslovsky et al., 2019).

Particular attention in scientific research is paid to the quality of digital content, the effectiveness of online learning, and successful practices in the use of digital technologies in education. A survey of teachers who received awards in the field of online learning from one of the three professional associations in the United States made it possible to identify five main factors of effectiveness (Kumar et al., 2019):

- Authentic and relevant course materials that are related to practice
- Use of multimedia resources,
- Involving students in the creation of digital content
- Monitoring of the learning process, analysis and improvement of course materials
- Instructor's explanation of the purpose of actions, technologies and assessments in the online course.

Additional factors that increase the quality of digital content are as follows: taking into account the regional specificity of educational systems (Gudmundsdottir, 2010), the needs of students; and an interdisciplinary approach to attracting experts (not only concerning the content of the academic discipline, but also in computer science and pedagogy) developing electronic resources (Song, 2018).

E.A. Dyakova and G.G. Sechkareva draw attention to the need to create a quality control system for the materials presented in the electronic educational environment (D'yakova, Sechkareva, 2019). This conclusion is confirmed by the results of empirical studies within the framework of the analysis devoted to the implementation of the "Moscow Electronic School" project. A large amount of low-quality material limits a teacher's enthusiasm for the use of digital

resources in the selection of information for their lessons. The opinions are often expressed by teachers that the educational contents do not meet quality standards. Lesson scripts hosted in the electronic environment often have informative and methodological errors (Frolova et al., 2019). Moreover, the information glut of the educational space without ensuring quality control of electronic resources leads to serious losses, pushing authorial scientific developments and innovative pedagogical finds to the periphery of public attention.

The results of research and pedagogical observations illustrate a number of problems related to financing (Slama, Choukir, 2019) and the provision of educational institutions with the necessary infrastructure and software. The effectiveness of the digitalization of the educational environment is determined by the competence of IT specialists, resource support of teaching practices, the level of accessibility of digital technologies for each teacher (Antonova et al., 2018). At the same time, accessibility includes not only the availability of technological capabilities of an educational organization, but also the ability to take advantage of them (possessing appropriate skills, motivation, and temporary resources).

The effectiveness of introducing digital technologies into the educational space is determined by teachers' digital competencies and motivation. Personal and pragmatic reasons that motivate teachers to improve their skills in the field of information and communication technologies (Bullock, 2013) play a significant role here. N. Wright emphasizes the role of the teacher's pedagogical goals. The needs of students, in his opinion, are the main "personal motivators" of a teacher in the practice of using digital technologies, even when it is necessary to overcome technological obstacles (Wright, 2015). These findings are correlated with other studies in which particular importance is attached to issues of digital trust, the formation of a conscious attitude, and loyalty to the processes of implementing digital technologies. "Perceived utility" is a key factor in determining the willingness and effectiveness of using digital technology in the learning process (Matsiola et al., 2019). In this regard, marketing of "digital learning" in the educational sector, which is traditionally afraid of technological innovations, is becoming especially relevant.

The research results illustrate that in the context of digitalization of education, the personal and professional qualities of teachers become especially important: their experience, working skills in an online environment, the desire to improve their skills, the desire to learn, and the continuous improvement of their skills. A teacher should strive to use a wide range of strategies in the process of interacting with students, using new materials and analytical data (Kumar et al., 2019). Developing the point of view by S. Kumar, one should consider the possible directions of the formation of the teacher's motivation to use digital technologies. This is one of the fundamental issues determining the success of the digitalization of education. The teacher's lack of interest in this process may limit any managerial ideas and attempts to introduce digital technologies "from above". As a result, many studies emphasize that there is a "great gap" between the declared need for digitalization of education and the real situation in classrooms.

When choosing alternatives that provide teachers with a motivation to use digital technologies, trust and cooperation are considered as the most promising areas as opposed to organizational pressure. Digital trust refers to the fundamental aspects of information and computer social interactions (Dedyulina, 2016). Digital trust is ensured by the following factors: preservation of copyrights when posting materials in an electronic environment, the teacher's confidence in the usefulness and reliability of digital services, an understanding of the main directions of digitalization, and the predictability of the actions of subjects in the educational space. Collaboration and horizontal connections contribute to the development of shared values (Evstratova et al., 2016), and informal institutional norms aimed at enhancing the teacher's position in improving their computer literacy, and their readiness for the active introduction of digital technologies in the educational process. Institutional norms play an important role in overcoming the prevailing stereotypes and rejection of digital innovation (Rogach et al., 2017).

Continuing education, additional education of teachers in the field of information and communication technologies can be considered as a compensator for the negative consequences of digitalization of education to ensure the involvement and interest of teachers in digital technologies (Chapman et al., 2010). Didactic and methodological training of teachers (Zahorec et al., 2019), support by school management, and also tutor support (Fleisch et al., 2016) in the process of acquiring new skills can increase the success of the implementation of information and communication technologies in the educational space.

4. Discussion

Answering the question "What kind of school will be in 2030?" scientists see digital technologies as the main determinant of transformations. Trends in the scientific literature include prevalence of data control, digital registration, and the de-territorialization of school education (Selwyn et al., 2019). Attributes of the new reality in the context of digitalization will be such phenomena as the "digital divide", "digital citizenship", and "digital socialization" (Safuanov et al., 2019).

In connection with the actualization of these trends, the contradiction between the youth's need to develop their digital competencies and the awareness of the insufficient knowledge and skills for using information and communication technologies in academic life or in their professional future is particularly worrying (Martin et al., 2019). According to scientists, the education system does not fully meet the new modern challenges and trends associated with the development of information and communication technologies.

Although digital technologies are being integrated everywhere in the system of general and professional education today, they are considered only as "additional tools". In the future, experts predict a change in this situation. Intensive development of digital technologies can "marginalize" or exclude the human factor and direct interaction from many areas of public life, including education (Fenwick, Edwards, 2016).

In the context of digitalization, the foundation for the formation and development of competencies are educational electronic contents, interactive forms of developing skills and abilities (virtual reality, simulators, etc.), network interaction and cooperation, and gamification methods. Formal and informal activities based on information and communication technologies, including digital interactive methods, game practices, and visual effects, can facilitate learning and increase student motivation (Craciun, Bunoiu, 2019). Additional advantages of digitalization of education are the following: a personalized approach in the learning process to the needs and interests of the person through the use of artificial intelligence, building individual educational routes, increasing the intensification of the educational process, differentiating the forms of teaching material and knowledge control, developing self-organization of subjects of the educational space, and formation of flexible mechanisms for motivating students. An analysis of the scientific discourse on the digitalization of education allows us to conclude that there are stable relationships between the development of network interactions, cooperation between students and teachers in the online space and the formation of the social and cultural capital of an individual.

A comparative analysis of the conceptual provisions presented in the scientific literature made it possible to identify several bipolar trends in the digitalization of education. On the one hand, the availability of library resources, electronic content, and lecture materials of the best teachers in the world creates the conditions for obtaining a quality education, regardless of income or place of residence of students. On the other hand, according to experts, only the part of the population that has digital literacy and online work skills can take advantage of digitalization. Moreover, scientists connect the development of information and communication technologies with the formation of a new digital divide. The increasing demands of the labor market for the skills and competence of individuals in the context of digitalization reduce the competitiveness of young professionals who do not have the material and financial base for their formation. In addition, the lack of digital literacy in the near future may be seen as a significant barrier to educational services.

The level of teachers' digital competence, their motivation and willingness to introduce digital technologies are among the most significant conditions for the successful use of digital technologies in the educational space. It is the figure of a teacher that is the central link and the conductor of the transition from the declaration concerning the education digitalization ideas to their actual implementation in school classes or lecture halls in universities. Without the active involvement of the pedagogical community in the digitalization processes, and without their interest in the success and productivity of digital learning, the risks of imitating activities in this area, and primitivizing the goals and objectives of digitalization are actualized.

Factors that increase the teachers' effectiveness in the development of their digital competencies include the following: involvement of experts in the development of curricula (Song, 2018); their relevance to the specifics of regional educational systems (Gudmundsdottir, 2010); formation of teacher's loyalty to the implementation of digital technologies (Matsiola, 2019); development of sustainable organizational relationships (Mueller-Oppliger, 2010;

Badykov, 2018); resource and personnel support for teacher training (Fleisch et al., 2016). Monitoring and moderation of electronic content and elimination of technical problems can be considered as drivers of successful digitalization of education. Despite a significant backlog on the formation of the teacher's digital competencies, the issues of developing teachers' readiness to use digital technologies in the educational process and overcoming key stereotypes remain insufficiently studied.

A critical analysis of publications on this topic allows us to determine the possible destructive consequences of the digitalization of education: ousting experienced teachers with insufficient digital competencies from the educational space; information overload, an increase in cognitive distortions, practices of activity imitation, deepening of the digital divide, and transformation of the evaluation criteria of the teacher's activity. In addition, the problems of formation of interpersonal communication competencies, students' analytical skills, dehumanization and formalization of training, narrowing the boundaries of direct interaction between teachers and students have a high degree of relevance. In addition to this, E.V. Ustyuzhanina and S.G. Evsyukov in their study reveal the factors that determine the decrease in the level of students' preparation in the context of digitalization of education (Ustyuzhanina, Evsyukov, 2018):

• Motivation dysfunctions. The development of "digital dependence" on external information. Decreased motivation for the accumulation of knowledge in the context of their wide availability in the online space. Lack of knowledge (students are sure that it is not necessary to remember anything, since all the information is on the Internet) does not allow the corresponding competencies to form

• Dysfunctions of the control and assessment of knowledge (tests are perceived as the only and universal assessment mechanism). In addition, in the context of digitalization of education, the load on the independent development of educational material is significantly increased. The insufficient level of media competence of modern youth shifts the focus of preparation towards eclecticism; there are risks in matters of assessing the "necessary" information and the "best" source of information.

• Communication dysfunctions in the learning process: socio-psychological problems in communication, insufficient level of development of competencies associated with teamwork, solving problems of interpersonal and intercultural interaction

• Dysfunctions of "Internet education" (freedom of choice of information sources, risks of manipulation and distortion of information in the Internet space can negatively affect the spiritual and moral aspects of personality development, its civic identity, value orientations and beliefs).

The transformation of the identity and moral attitudes of young people is associated not only with the processes of globalization, the dominance of the values of the consumer society, but also with the new risks of digitalization. The effects of the digital age are changing consumer strategies and the social structure of society, and prioritizing the enjoyment of life. The large-scale transfer of civic and political practices to the online space, the mobilization opportunities of the Internet (Brodovskaya, Huang, 2019), along with factors such as the risks of information distortion, the possibility of manipulating the public consciousness, present new requirements for the institution of education. In the context of digitalization, pedagogical practices should ensure the formation of media competences of individuals and their civic-mindedness.

The authors turn to the ideas manifested by N.Sh. Kozlova, according to which digital technology is a necessary but not sufficient condition for improving the quality of educational and upbringing work (Kozlova, 2019). The effectiveness of the educational process is determined, first of all, by teachers' activities, and by the practices of their direct interaction with students. In modern conditions, digital technologies should be integrated into the educational space, but not supplant traditional forms of learning. A reasonable combination of digital and traditional pedagogy will allow us to adequately respond to the challenges of the time in the educational field, and to prepare competitive specialists (Kryukova, 2018).

A critical analysis and generalization of the results of the scientific discourse on the introduction of digital technologies in the educational process allows us to formulate a number of principles that increase the success of the education digitalization process, at the same time, decreasing its negative consequences:

1. Formation of institutional conditions that ensure the effectiveness of the introduction of digital technologies in the educational space. Of key importance in this context are the

predictability of the management entity's actions, the actualization and popularization of reforming the educational sector in the pedagogical community. Institutional conditions can be divided into formal and informal. Formal conditions include resource support for the introduction of digital innovations, normatively consolidated requirements for pedagogical activity, the use of digital technologies to enrich the educational process, assess students' knowledge, and increase their interest in learning. Informal conditions include the legitimization and dissemination of the values of the digital society, the support of pedagogical practices based on the recognition of the "usefulness" of digital technologies. We are talking about the formation of socially approved patterns of behavior, and the orientation of teachers towards the search for new solutions to optimize the educational process, and to increase the interest of young people in learning in the context of digitalization. A motivating and stimulating system can be a significant factor providing material and moral support to teachers, who effectively use information and communication technologies in the educational process, and who are ready for self-education and self-development in the context of digitalization.

2. Consideration of situational factors. Situational factors determine the level of compatibility of digital innovations with the actual situation in a particular educational organization, and the interests of the main subjects of its microenvironment, as well as with the wider context of socio-cultural and economic conditions for the development of society. "Cultural norms challenge educational technology" (Al Lily et al., 2016). Innovative managerial practices acquire permanence when they are enshrined in the organization's activities, the skills of the main subjects of the educational space. Internal organizational factors include the needs and requirements of students, technological potential, objective (digital readiness, skills) and subjective (willingness, motivation to work in a digital environment) teaching staff capabilities. This principle assumes the maximum consideration and compliance of methods and forms of digitalization of education with the specifics of the learning process in a particular educational organization, the real situation of professional activity in terms of its subject and social content.

3. Resource support for the practical implementation of digital technologies in the educational space. According to V.A. Agafonov, the potential prerequisites for implementing progressive innovations are faced with resource and organizational and managerial constraints (Agafonov, 2015). The adaptability of the subjects of the educational space to the new requirements of digitalization is determined by the technological, infrastructural and methodological support of the formation and development of the electronic learning environment. Resource support for the digitalization of education includes the following elements: information and communication infrastructure, organizational support from management and IT specialists, a continuing education system and tutor support for professional activities

4. The priority of the interests of an individual as a key criterion for the effectiveness of digitalization processes; the creation of conditions for successful socialization and unlocking the potential of students in the electronic educational environment. The subject-centered approach actualizes the practice of cooperation, teamwork. The development of strategies for digitalization of education should be based on the consolidation of the interests of the professional pedagogical community and the needs of students. The contradiction between the need for digitalization of education and the existing target settings, and the insufficient level of readiness of the pedagogical community to use digital technologies can be offset by prioritization in favor of active and self-governing actions of subjects of the educational space and the development of digital trust.

5. Integration of the digital and traditional pedagogy concepts. The role of a teacher, even in a digital environment, cannot be limited to tutorial support. Communication between a teacher and a student has a meaning-forming value; it allows the analytical and communicative skills of students to form. It is traditional pedagogy that ensures the implementation of the educational function and creates conditions for the socialization of youth. In conditions of modernization of approaches to education (from the paradigm of knowledge formation to the paradigm of competency formation), it is the methods of traditional pedagogy that will become crucial in the practice of training a competitive specialist.

5. Conclusion

Digital technologies, being an integral part of the new social development reality, significantly change the learning process in schools and higher educational institutions.

Digitalization of education is a process of systemic modernization of the educational space based on the use of digital technologies. New trends in the digitalization of education include online teaching, interactive teaching methods, including digital gamification technologies, virtual learning environments, artificial intelligence, horizontal network communications, etc. The lack of infrastructural support and the willingness of teaching staff to introduce digital technologies into the educational process is the reason for the primitivization of the key tasks of digitalization in low-resource educational organizations.

The main advantages of digitalization of education are the following: an individual approach to students through the use of artificial intelligence, the formation of personal learning paths, increasing the intensification of the educational process and students' interest in it, increasing academic performance, differentiating forms of teaching material and knowledge control, developing social and cultural capital of an individual. However, despite the obvious advantages of using digital technologies in the educational process, there are certain risks and destructive consequences associated with the deformation of the teacher's pedagogical work and the practice of teaching and educating young people. From the teacher's point of view, this is the displacement of experienced teachers with an insufficient level of digital competencies from the educational space; transformation of the evaluation criteria for teachers; increase in additional load, displacement of the vector of pedagogical work in the electronic educational environment, narrowing the boundaries of direct interaction between teachers and students. From the point of view of students, they are: information overload, an increase in cognitive distortion, the emergence of problems in the formation of interpersonal communication competencies, students' analytical skills, dehumanization and formalization of training. In the context of digitalization, risks associated with a decrease in the quality of education and the student training level become actual. These risks are determined by the following dysfunctions: motivation (lack of need to memorize knowledge in the conditions of their wide availability), control and assessment of knowledge, communication, and "Internet mentoring".

The main compensators for the negative consequences of the digitalization of education may include the following: improving the system of teacher training and motivation, modernizing control practices of the educational content, group collaboration, digital trust. Digitalization can be considered as an optimal trend in the development of education, if it corresponds to a number of principles: the formation of appropriate institutional conditions (normatively consolidated requirements for pedagogical activity, the legitimization and dissemination of the values of a digital society), the consideration of situational factors, resource support, the priority of personal interests (subject-centered approach), the integration of the digital and traditional pedagogy concepts.

An analysis of the scientific discourse on the issues of digitalization of education allows us to state that, despite the existing backlog, a number of problems have remained insufficiently studied. The following areas can be considered relevant: further development of digital learning, development of digital trust, technologies for digital maturity formation, methods for evaluating the quality of electronic content, mechanisms to increase the productivity of digital learning, and preventing digital inequality.

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