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**IMPROVING THE TRAINING OF TEACHERS IN THE DIGITAL  
TRANSFORMATION OF EDUCATION**

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*Abstract*

The article explores the core techniques of improving the professional training of teachers of the future in the digital transformation of education. The aim of the article is to identify activities that are intended to ensure the quality training of teachers of the future in the digital transformation of education. It is proposed to develop the human resource potential of future teachers who are ready to carry out pedagogical activities in a digital environment. The steps are taken to create the conditions for the vocational training of the teacher of the future in terms of the development of new educational programs and the inclusion in existing educational programs of new subjects related to the formation of the digital competences of the teacher, Modernizing the content of educational subjects, introducing new models of teaching, and integrating mass open online courses (MOOC) into educational programs. Special attention is paid to the digital transformation of the university, the digital transformation of the teacher, the peculiarities of the students of the new generation - generation «Z», the need to introduce the discipline «Digital didactics» into the content of educational programs, Institutionalization of the mentoring system as an important resource for the development of the professionalism of educators, the development of new basic and complementary educational programs aimed at preparing teachers of the future and filling professional deficits. Skills have been identified within the framework of the digital competence of the teacher, which are proposed to be developed during the implementation of new educational programs.

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**Keywords:** Digital transformation of education, digital transformation of the teacher, digital competence, digital literacy, new generation, professional skills.



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## 1. Introduction

The most important part of the educational process is a teacher with key and professional competences, who has knowledge of current educational technologies and is involved in the active process of maintaining the functioning and development of the process.

The activities of the teacher involve a multitude of work functions, which in turn are provided by a set of competencies embodied in the knowledge, skills, skills and personal experience of the teacher, which makes it possible to determine the general level of professionalism of the teacher. Among many competencies that determine the performance of the teacher, those that most reflect both trends of modern education and society as a whole comes to the fore. With the digital transformation of education, the challenge for teachers is to acquire new competencies to ensure the effective organization of education using digital technologies.

The results of the monitoring of digital literacy of Russian teachers in schools and higher education Aymaletdinov et al. (2019) provided by the National Agency for Financial Research shows that teachers, in general, have a high level of digital literacy (87 percent for school teachers and 88 percent for university, teachers), show and show moderate activity in the use of digital technologies in teaching. The results of the study show a difference in the ICT competencies of school and university teachers. School teachers are more likely to interact with colleagues from other schools through digital communication to share information, to improve their professional skills through online communication training, taking greater responsibility for the security of the use of information technology in educational activities.

University teachers, in turn, are better equipped to create digital teaching materials, adapt existing ones, and change existing digital teaching materials and resources. They are also more likely to organize students into working groups to undertake project activities through digital services that allow, for example, collaborative editing of documents based on cloud services.

The results of the special project showed which ICT competences need to be developed in educators first. Among these competencies were the following:

- Digital communication with students and colleagues;
- Exchange and creation of materials with fellow educators in cloud systems;
- Use of computers to create new training materials and adapt existing ones;
- Improved knowledge of ways to protect information;
- Assessing the reliability of information and identifying false or biased information;
- Secure and responsible use of digital technologies;
- Creative use of digital technology for educational purposes;
- Use of digital technologies in the educational process and the monitoring of students' online activity;
- Use of digital tools to measure and track student progress and the need for additional support.

Taking into account the results of the NAFI study (2019), we believe that at the present time the productive integration of teachers into the digital transformation of education is hindered by an occupational shortage. The creation of effective mechanisms for filling professional deficits is one of the important tasks of the federal project «Teacher of the Future» of the national project «Education». The

filling of professional deficits, as well as the formation of ICT - the competence of educators of the future, who are able to organize and carry out pedagogical activities in a digital educational environment, requires certain activities to develop the human capital of the digital educator.

## **2. Problem Statement**

The digital approach, which covers the field of education encourages the teacher to learn about the most relevant technological tools and methods for implementing the educational process. The teaching, management and technical staff of educational organizations are responsible for integrating technologies and taking advantage of digital opportunities in the educational space. Results of the comparative analysis of the digital environment of the leading universities of the world and the Russian Federation Brodovskaya et al. (2019) enabled the researchers to identify the key issues of the digitization of Russian universities, among which the issues of the online-reading accompaniment of applicants; Digital education, de-personalization of education; Placement of educational cases; Poor interaction of online learning support.

We believe that the human resources of future teachers who are ready to implement the educational process in a digital environment must be built up among real students. The solution to this problem, in our view, is the modernization of the educational process itself at the university, including the construction of individual study paths and the identification of the best ways for digital interaction among participants in the educational process, Development of a passport of digital competences of the educator of the future, creation of personal information and education environment of teachers and students, selection of effective pedagogical technologies, trajectories, and paths of study in the digital environment, The development of digital didactics as a branch of pedagogy. It is in the digital aspect that the formation of both «hard» skills (hard skills) and «flexible» (soft skills) should also take place.

Already in higher education, students - future teachers - must acquire a number of competencies that will enable them to continue their education in a digital educational environment, and to that end, they must become active participants in the educational process in a digital environment, and the digital environment of the university should be represented by the world community. Pogrebnykov et al. (2019) identified a relationship between students' use of a personal educational environment and their academic performance: students who actively use instruments of a personal educational environment have a higher average score and are more successful take evaluations.

## **3. Research Questions**

Under this article, we will look at ways and possibilities to improve human capital in the digital transformation of education. We shall highlight measures for the development of the training of the teacher of the future in terms of the development of new educational programs and the inclusion in existing educational programs of new subjects related to the formation of the digital competences of the teacher, modernizing the content of educational subjects, introducing new models of teaching, and integrating mass open online courses (MOOC) into educational programs.

#### **4. Purpose of the Study**

The purpose of the article is to define the activities which are intended to ensure the quality training of teachers of the future in the digital transformation of education.

#### **5. Research Methods**

The preparation of the theoretical basis of the study took into account such methods of scientific knowledge as the analysis, comparison, and synthesis of the results of contemporary research and publications available in science related to the study and presentation of experiences in the digital transformation of education. The practical part of the article is executed on the basis of empirical methods of knowledge: observation, comparison, modeling. The conclusions are derived from the deductive method.

#### **6. Findings**

The professional functions of the top teachers in the digital age, the specifics of their interaction with the new generation of students, the construction of a new paradigm of higher education and the paths of communication in the digital the environment are currently being actively studied by scientists from different countries, which is reflected in the results of their research (Cabellon & Junco, 2015; Hashim, 2018; Saykili, 2019; Schejbal, 2012).

The digital transformation of education is considered by Shutaleva et al. (2019) in the context of humanization. Kolesnikova (2019) notes that the creation of effective methods of learning and self-education in the digital age is possible only if the basic didactic categories and concepts are redefined and re-evaluated on a transdisciplinary basis, taking into account the pedagogical experience of the analog era and preserving continuity humanitarian values and meanings (p. 67). Our task is to carry out the digital transformation of the educational process in the most sparing way in relation to previous scientific knowledge, while preserving continuity, since the provisions of the fundamental sciences are the basis of the traditional teaching materials.

The digital transformation of the university is thorough and daily work, especially of teachers. For example, models of mixed education: the rotation model (rotation of stations, laboratories, «inverted class», individual rotation), the «flexible» model, the «choice» model, the extended virtual model, should be implemented already in the university, if we want future teachers to come to school after graduation and apply modern pedagogical techniques with confidence and efficiency in practice. It is the university teachers who must organize the educational process according to the needs of the economy and society. The translation of traditional lectures into the digital quality format and their rendering into independent work also requires teachers to have certain competences, and from the university a modern material and technical base.

University entrants - prospective students that have different levels of digital literacy and a common information culture at the start of their studies. The first task - for the university, speaking about the successful digital transformation of education - is to equalize the start-up ICT competence necessary for the comfortable start of education in the digital university. We also consider it important to launch

digital adaptation measures for first-year students to study in a digital environment, including the formats of undergraduate studies.

A decisive role in the acquisition by future teachers of the necessary competences for the organization of the educational process in the digital environment is assigned to the introduction of «Digital Pedagogy» into the content of educational programs. Hilltdinova et al. (2019) justify the need to include the concept of «digital pedagogy» in the scientific apparatus of modern pedagogy as a phenomenon reflecting a new field in the development of conceptual bases of modern education. Similar experience already exists in Peoples' Friendship University of Russia in the form of development and realization of the online course of digital literacy of educators «Digital Pedagogy».

When it comes to improve the training of educators of the future, it is impossible not to pay due attention to the role of motivation in improving the professional competences of current teachers. Analyzing the influence of a teacher's motivation on his professional behavior and student motivation, Kalyar et al. (2018) note a direct positive relationship between the teacher's and student's motivation, as well as the indirect influence of the motivation of the pedagogue through educational practices, taking into account the interests of the students and the control of the effectiveness of the learning material of each of them. Bykova (2019), defining the conditions for motivating students to innovate at the stage of higher pedagogical education notes the importance of creating an atmosphere of support from teachers and administration. As a result of research into the interaction of students of higher education with the educational content in the information educational environment of Belyakova and Zakharova (2019) It is noted that students rate their activity and performance in motivating interaction with educational content much better than their teachers.

Mentoring as a resource for the development of teachers' professional competencies is of particular importance in finding effective ways to train future educators. The need for an institutional system of mentoring in Russian schools, based on the sociological study of Margolis et al. (2019), is no less important, in our view, for higher education institutions, However, the mentoring vector for digital education is directed from educators with a high level of digital competence, usually younger in age, Teachers who need to be more motivated in the use of digital technologies in the educational process and in the development of professional competencies.

We believe that mass open online courses play a special role in the development of professional pedagogical skills. Questions of integration of MOOC into the educational process, as well as their structuring and formats of educational content, advantages, disadvantages, related pedagogical risks are addressed in the studies of Starodubtsev et al. (2019), Zakharova and Tanasenko (2019); Bozkurt et al. (2016), Evans and Myrick (2015); Gil-Jaurena and Domínguez (2018).

We consider the development of basic and additional educational programs providing for the development of new pedagogical competencies to be one of the most significant steps in the development of the potential of both teachers and students in pedagogical fields, The educational process needed in the digital transformation of education. The content of these programs must take into account the needs of educators in the development of digital competences, in the formation of ideas and skills on the creation of digital educational content for representatives of the new generation of students, which are assigned to the «digital generation» (Z-generation). Considering psychological peculiarities of educational and

cognitive activity of the generation «Z» and peculiarities of pedagogical work with them, Petrunov et al. (2019) note the change of mechanisms of cognitive processes and the formation of new behavioral types, which necessitates the application of innovative, realistic methods of teaching and education.

The modern generation of users of educational content - the generation of «Z» - is characterized by a number of features of the world view, dictated by the digitization of different aspects of society's life: small duration of the concentration of attention, multitasking, which demonstrates the ability to perform multiple tasks simultaneously in a short time, high speed of visual information perception, individualization, clear prioritization. As of today's school children and students have changed, new teaching aids must be developed with a new type of perception in mind.

Taking into account the portrayal of the modern user of educational content, the digital transformation of teachers, which involves:

- Active use of the information and educational environment of the university;
- Creating personal information and educational environment;
- Creation of digital educational content aimed at the current generation of students;
- Use of interactive, mixed learning models;
- Regular interaction with students in a digital environment.

At present, digital transformation issues, for example, a teacher of Russian as a foreign language, related to the definition of the content of the information culture of the teacher of the RCT, the level of formation of its components in the professional activity of Deryabina and D'yakova (2018; 2019a; 2019b), by clarifying the content of the information and communication technology competence of Mitrofanova and Zhrebtsova (2019), the professional culture in the globalizing world of Shaklein and Mamontov (2019), is actively researched, and the results are translated into the content of the curricula of the new educational programs. Thus, in line with the goal of improving the training of teachers of the future in the digital transformation of education, the Tambov State University named after G.R. Derzhavin has been running a master's degree program since 2019 for teachers of the future in the context of the digital transformation of education «Linguistics» «Theory and practice of teaching Russian as a foreign language in digital humanitarian knowledge» (Digital Humanities). The aim is to train highly qualified teachers of Russian as a foreign language for teaching both in Russia and abroad. The training of pedagogical personnel in the Russian Federation corresponds to the tasks of integrating Russia into the international political, economic and educational sphere.

The aim of the training is not only to acquire theoretical knowledge of the teaching of the Russian language in a foreign audience, but also to train future teachers in the use of digital and electronic teaching tools for teaching Russian as a foreign language, interactive technologies in own pedagogical practice, training skills using Web 2.0 tools: Internet communication, web platforms, online platforms for constructing educational materials and testing knowledge, cloud services, remote systems, as well as self-creating digital educational content based on online services, using the linguistic potential of Internet resources, organizing effective online education.

## 7. Conclusion

Digital University is becoming the main link in continuous training for a digital economy - a catalyst for the transformation of the region's economy, from pre-school education to the generation and implementation of innovation. We believe that, in order to prepare teachers for the future, higher education institutions need to develop a common strategy to improve vocational training in the context of the digital transformation of education.

Within the framework of this study, we shall identify selected activities aimed at improving the professional training of teachers of the future in the context of the digital transformation of education, as well as at filling the professional shortage of teaching staff. We believe that the development of the professional competences of educators necessary for the implementation of the educational process in a digital environment is served not only by the development of new basic and additional educational programs, but also by such measures as:

- Development and implementation of refresher courses, internships, the introduction of a system of working in tandem, mentoring oriented towards the digital transformation of teachers, creation of digital educational space for teachers of the future;
- Digital didactics - a branch of pedagogy, a scientific discipline on the organization of the educational process in the digital environment of public life - is included in the list of study subjects;
- Implementation of the educational process in higher education, taking advantage of the digital educational environment;
- Active implementation of mixed learning models.

The active role of universities in digital transformation should, in our view, take into account the risks involved and prevent the formalization and imitation of education. It should not be forgotten that the center of the educational process is the learner, and the aim is to create the conditions for the formation of a successful, competent, creative, highly moral individual who is aware of the responsibility to society for the present and future of his country. The basic values of pedagogical activity continue to be the humanistic culture of the pedagogue, a high level of education, professional competence, the moral orientation of the personality of the pedagogue and cooperation between the pedagogue and the pupils, based on cooperation.

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## References

- Aymaletdinov, T. A., Baimuratova, L. R., Zaitseva, O. A., Imaeva, G. R., & Spiridonova, L. V. (2019). *Digital literacy of Russian educators. Readiness for the use of digital technologies in the educational process*. Publishing house NAFl.
- Belyakova, E. G., & Zakharova, I. G. (2019). Interaction of students of the university with educational content in the information educational environment. *Education and science*, 21(3), 77-105. <https://doi.org/10.17853/1994-5639-2019-3-77-105>

- Bozkurt, A., Ozdamar, K. N., & Waard, I. de (2016). Research Trends in Massive Open Online Course (MOOC). *Theses and Dissertations: Surfing the Tsunami Wave. Open Praxis*, 8(3), 203–221. <https://doi.org/10.5944/openpraxis.8.3.287>
- Brodovskaya, E. V., Dombrovskaya, A. Y., Petrova, T. E., Pyrma, R. V., & Azarov, A. A. (2019). Digital environment of leading universities of the world and the Russian Federation: results of comparative analysis of site data. *Higher education in Russia*, 12, 9-22. [https://doi.org/10.31992/0869\\_3617\\_2019\\_28-129\\_22](https://doi.org/10.31992/0869_3617_2019_28-129_22)
- Bykova, E. A. (2019). Formation of motivation for innovative activity among students –future teachers. *Prospects for Science and Education*, 4, 102-115. <https://doi.org/10.32744/pse.2019.4.9>
- Cabellon, E. T., & Junco, R. (2015). The digital age of student affairs. *New Directions for Student Services*, 151, 49–61. <https://doi.org/10.1002/ss.20137>
- Deryabina, S. A., & D'yakova, T. A. (2018). A Foreign Language Teacher's Professiogram in the Conditions of Digitalization of the Educational Process. *The European Proceedings of The European Proceedings of Social & Behavioural Sciences*, 51, 600-607. <https://doi.org/10.15405/epsbs.2018.12.02.65>
- Deryabina, S. A., & Dyakova, T. A. (2019a). Professiogramma prepodavatelya inostrannogo yazyka v usloviyakh tsifrovizatsii obrazovatel'nogo prostranstva [Professiogramma of a foreign language teacher in the conditions of digitalization of the educational space]. *Higher education in Russia*, 4, 142-149. <https://doi.org/10.31992/0869-3617-2019-28-4-142-149> [in Rus]
- Deryabina, S. A., & D'yakova, T. A. (2019b). Information culture of the RFL teacher:content, present conditions, perspectives. *The European Proceedings of the European Proceedings of Social & Behavioural Sciences*, 77, 721-728. <https://doi.org/10.15405/epsbs.2019.12.77>
- Evans, S., & Myrick, J. G. (2015). How MOOC Instructors View the Pedagogy and Purposes of Massive Open Online Courses. *Distance Education*, 36(3), 295-311. <https://doi.org/10.1080/01587919.2015.1081736>
- Gil-Jaurena, I., & Domínguez, D. (2018). Teachers' Roles in Light of Massive Open Online Courses (MOOCs): Evolution and Challenges in Higher Distance Education. *International Review of Education*, 64(2), 197–219. <https://doi.org/10.1007/s11159-018-9715-0>
- Hashim, H. (2018). Application of technology in the digital era education. *International Journal of Research in Counseling and Education*, 1(2), 1–5. <https://doi.org/10.24036/002za0002>
- Hilltdinova, E. U., Belyaeva, T. K., & Lebedeva, I. V. (2019). Digital pedagogy: features of the evolution of the term in the categorical-conceptual apparatus of pedagogy. *Prospects for Science and Education*, 4(40), 33-43. <https://doi.org/10.32744/pse.2019.4.3>
- Kalyar, M. N., Ahmad, B., & Kalyar, H. (2018). Teachers in student motivation mediating the role of professional teacher behavior. *Education*, 3, 91-119. <https://doi.org/10.17323/1814-9545-2018-3-91-119>
- Kolesnikova, I. A. (2019). Post-pedagogical syndrome of the era of cyto-modernism. *Higher education in Russia*, 8-9, 67-82. [https://doi.org/10.31992/0869\\_3617\\_2019\\_2828-8\\_9\\_67-82](https://doi.org/10.31992/0869_3617_2019_2828-8_9_67-82)
- Margolis, A. A., Arzhanykh, E. V., & Khusnutdinova, M. R. (2019). The institutionalization of mentoring as a resource for the professional development of Russian teachers. *Education*, 4, 133-159. <https://doi.org/10.17323/1814-9545-2019-4-133-159>
- Mitrofanova, I., & Zherebtsova, Zh. (2019). A professional competence of russian teacher in the conditions of educational digitalization. *The European Proceedings of The European Proceedings of Social & Behavioural Sciences*, 59, 548-559. <https://doi.org/10.15405/epsbs.2019.12.59>
- Petruneva, R. M., Vasilyeva, V. D., & Petruneva, Yu. V. (2019). Digital students: myths and reality. *Higher Education in Russia*, 11, 47-55. <https://doi.org/10.31992/0869-3617-2019-28-11-47-55>
- Pogrebnykov, A. K., Shestakov, V. N., & Yakunin, Yu. Yu. (2019). Personal educational environment as a tool to improve student performance. *Prospects for Science and Education*, 6(42), 473-483. <https://doi.org/10.32744/pse.2019.6.39>
- Starodubtsev, V. A., Sitnikova, O. V., & Lobanenko, O. B. (2019). Content optimization of the online course according to user activity statistics. *Higher education in Russia*, 8-9, 119-127. [https://doi.org/10.31992/0869\\_3617\\_2019\\_2828-8-9\\_119-127](https://doi.org/10.31992/0869_3617_2019_2828-8-9_119-127)



- Saykili, A. (2019). Higher education in the digital age: The impact of digital connective technologies. *Journal of Educational Technology & Online Learning*, 2(1), 1-15. <https://doi.org/10.31681/jetol.516971>
- Schejbal, D. (2012). In search of a new paradigm for higher education. *Innovative Higher Education*, 37(5), 373–386. <https://doi.org/10.1007/s10755-012-9218-z>
- Shaklein, V. M., & Mamontov, A. S. (2019). Russian as a foreign language teacher's professional culture in the globalized world. *The European Proceedings of The European Proceedings of Social & Behavioural Sciences*, 45, 420-430. <https://doi.org/10.15405/epsbs.2019.12.45>
- Shutaleva, S., Kerimov, A. A., & Tsipalokova, Yu. V. (2019). The humanization of education in the digital age. *Prospects for Science and Education*, 6(42), 31-43. <https://doi.org/10.32744/pse.2019.6.3>
- Zakharova, U. S., & Tanasenko, K. I. (2019). MOOC in higher education: advantages and disadvantages for teachers. *Education*, 3, 176-202. <https://doi.org/10.17323/1814-9545-2019-3-176-202>