Innovative Master's program «Digital Pedagogy»

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Abstract. This work is devoted to the development of a new master's program, created on the basis of a sociological study of stakeholders, including an innovative digital component. As a result of the sociological research, the main interests of stakeholders and the requirements for the competencies of teachers were identified. The stakeholders were the heads of educational organizations and students of pedagogical universities. A survey of 823 students of higher educational institutions and more than 200 principals of Russian schools was conducted through Google forms using open questions. Based on the received request, a pool of competencies was formed, which is necessary for a teacher in professional activity. As a result, the master's program "Digital Pedagogy" was developed, which includes a digital component of each universal and general professional competence, as well as three professional competencies developed by the university for this program. The competence model of a graduate assumes that he / she has the skills to develop and use digital educational solutions, technologies for developing and implementing digital gaming practices, skills for using STEAM training, skills for creating and promoting online courses, and the use of virtual and augmented reality in the educational process. The graduate should be able to use digital tools for collective and project work, video conferencing tools, video processing programs, video hosting services, apply digital learning management systems and activity planning, digital tools for searching, storing, processing and presenting educational information in the educational process.

1 A problem statement

One of the most pressing problems facing modern educational systems in the context of the Covid-19 pandemic [1] is the high-quality use of digital tools by teachers and students to improve the effectiveness of the educational process [2]. Studies have shown a low level of proficiency in digital tools of university and school teachers [3]. In their research, scientists from the Higher School of Economics talk about the incomplete psychological and physical readiness of teachers and students to fully switch to study using distance learning technologies [4]. Nevertheless, approximately 80% of teachers have mastered a large

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number of digital tools and are ready to use them in the future [5]. The quality of the distance learning process is influenced by many factors: the availability of software for teachers and students, the problem of high-quality Internet [6], the availability of material and technical support [7], the quality of the content used in training [8].

An important factor in the educational process is that students note a large number of positive features in the use of digital technologies in teaching, such as increasing the availability of material, visibility, and improving the quality of learning through the use of information bases [5]. When conducting sociological studies, it turned out that students are now more inclined to a mixed learning format [3]. Consequently, there is a problem of forming a system of mixed learning [9] with a wide use of digital tools, project activities [10] and interactive teaching methods [11]. Solving this problem requires a significant set of competencies from the teacher. The relevance of the development of the master's program "Digital Pedagogy" is to prepare experienced and young teachers for the full implementation of the system of mixed learning, based on interactive and project-based teaching methods using digital tools [12].

1.1 The objective of the work

The use of digital technologies in the educational process is widely considered in the works of domestic [13, 14] and foreign researchers [15, 16]. Including in the management of an educational organization [17], the organization of educational and educational activities [18], the use of team project tasks, digital tools provide increased efficiency and save time and resources [19, 20].

Based on the research results, we have established the need to develop an educational program to improve the digital competencies of teachers of educational organizations.

The aim of the research is to develop an educational program that allows teachers to obtain a set of necessary digital competencies.

The tasks are:

1. On the basis of a sociological study to determine the pool of competencies required by the teacher for the effective implementation of educational programs in the opinion of stakeholders.

2. To develop a graduate competence model based on the opinion of stakeholders.

3. To develop an educational program based on the obtained competence model.

2 Results of the research

The following research methods were used: analysis of literary sources, sociological research methods: interviewing and questioning, modeling methods. Semi-structured interviews were conducted with 208 directors of educational organizations in order to identify teacher competence deficiencies and to form a pool of necessary competencies. A survey of 823 first-year students of pedagogical universities was also conducted, the answers to the questions implied open answers, which allowed students not only to answer the questions posed, but also to express their opinion on the causes of individual problems [3]. As a result of the study of the interests of stakeholders, a certain pool of competencies was compiled that are necessary for a teacher to work effectively in a mixed learning system [5].

All the necessary competencies were combined into the following groups: information search, work in office applications, information processing and interpretation, statistical data processing, ability to work with projects, ability to visualize data [21], ability to use interactive tools, including virtual and augmented reality, ability to work in social networks

and messengers, ability to use video conferencing tools, ability to create educational video content and make digital decisions in the educational process [5].

Based on the simulated groups, digital elements were developed for the decomposition of competencies that are approved for the master's degree in teacher education. As a result of the construction of the graduate's competence model, digital elements for universal and general professional competencies were developed and professional competencies for the master's program "Digital Pedagogy" were formulated. According to the competence model of the graduate for universal competencies, the graduate should know: methods of digital data analysis for making decisions based on data, digital tools for planning project activities, digital tools for building communication in a team, mechanisms of digital communication in cross-cultural interaction, mechanisms for finding digital data necessary for self-development. Students within the framework of universal competencies should acquire the following skills: to analyze digital data for decision-making, to make diagrams and graphs of project stages, to use digital tools for organizing teamwork, to use digital tools for communication in a foreign language in the professional community, to use data analysis tools for self-development. Within the framework of mastering universal competencies, the student must possess: digital data analysis for decision-making, digital tools necessary for project management, mechanisms for organizing and managing a team in a digital environment, mechanisms for digital communication in the professional community, including in a foreign language, digital tools for diagnostics and self-development planning.

The decomposition of digital elements of general professional competencies assumes that the student knows: the mechanisms for introducing digital competencies into the educational process in accordance with the normative legal acts in the field of education and the norms of professional ethics; digital tools for designing educational programs, digital tools for monitoring the activities of students; mechanisms for searching digital databases containing information about basic national values; digital tools for the diagnosis of learning outcomes, the basics of psychological and pedagogical support for students in the digital environment; digital tools that can be used for the interaction of participants in educational relations; mechanisms for searching for research results in digital databases. As a result of mastering general professional competencies, students should be able to: use digital tools to optimize professional activities; search and filter information from digital databases for the development of basic and additional educational programs; use digital content for organizing educational and educational activities of students, including those with special educational needs; use digital tools for diagnosing the formation of spiritual and moral development; interact with specialists to develop overcoming learning difficulties through the use of digital tools; use digital tools for individualizing learning, development, and education of students, including those with special educational needs; apply digital tools to organize the educational environment; apply digital tools to organize the educational environment; apply digital tools to organize the educational environment.

In accordance to the competence model of general professional competencies, the graduate must possess: digital technologies for optimizing professional activity in accordance to regulatory legal acts in the field of education and professional ethics; digital tools for searching and analyzing data to improve the quality of the development of basic and additional educational programs; digital tools for planning the educational and educational process, taking into account the contingent of students with special educational needs; mechanisms for developing digital content for the spiritual and moral education of children based on Russian traditional values; digital technologies for monitoring the success of learning and digital tools for developing programs to overcome learning difficulties; mechanisms for designing and using effective psychological and pedagogical, including inclusive, technologies in professional activities using digital tools that are used to

individualize learning, development, and education of students with special educational needs; digital tools for planning the trajectories of development, training and education of students, taking into account their individual and age characteristics; digital tools that help to increase the scientific content, accessibility and visibility of materials used in teaching activities.

Also, the competence model of the graduate provides for the presence of two special professional competencies. The competence "Able to implement educational programs in accordance with the requirements of federal state educational standards" provides knowledge of the features of the organization of the educational process with the use of digital technologies in accordance with the requirements of educational standards; the ability to create an educational environment using digital tools that ensures the formation of students ' educational results provided for by the Federal State Educational Standard and (or) educational standards established by the educational organization and (or) the educational program; has the skills of professional activity in the implementation of programs of educational disciplines using digital tools. The competence "Able to apply modern methods and technologies of organizing educational activities, diagnostics and evaluation of the quality of the educational process in various educational programs" involves knowing: modern methods and technologies of teaching using digital tools, methods of diagnosing the quality of the educational process, including using digital tools; be able to: use modern teaching methods and technologies, including digital ones, evaluate the quality of the educational process, including using digital tools; possess: general theoretical foundations of disciplines to the extent necessary to solve pedagogical, scientific, methodological, and organizational and managerial tasks, including using digital tools.

The model also provides additional professional competence, which reflects the main specifics of the educational program: able to develop and implement digital educational solutions. Within this competence, the student must know: how to develop and implement digital educational solutions. Student must be able to: use digital tools for collective and project work, video conferencing tools, video processing programs, video hosting services; apply digital learning management systems and activity planning in the educational process; use virtual and augmented reality technologies in the educational process; possess: skills in developing and using digital educational solutions; technologies for developing and implementing digital gaming practices; skills in using STEAM training; skills in creating and promoting online courses.

On the basis of the developed competence model of the graduate, the master's degree curriculum was developed. The compulsory part of the curriculum includes academic disciplines that reveal the digital elements of universal and general professional competencies.

Critical analysis and methods of solving problem situations in science – this discipline afford to master the methods of searching for scientific information, algorithms for selecting information, familiarization with professional information databases, allows you to master the methods of theoretical analysis of information, the formulation of the goals and objectives of research.

Modern technologies of team building afford to study digital tools for interactive work, teamwork, for working on projects, and also study digital means of communication in a team.

The academic discipline Technology of professional career afford to study the possibilities of digital tools for self-education, additional education, to study professional databases and algorithms for their use, as well as the mechanisms for building educational programs using digital tools.

Project activity in the educational process-this discipline afford to master the basics of project activity, the mechanisms of its use in the educational process and individual digital tools for its organization.

Psychological and pedagogical support in mixed learning afford to study the features and contexts of the psychological state of students in a mixed learning format and the influence to this state, including using digital tools.

The part formed by the participants of educational relations implies the development of special and additional professional competencies, through the study of specialized disciplines.

The subject of Game Pedagogy afford to study modern game technologies used in the educational process, including both digital and analog aspects. Teaches you how to develop your own games and apps.

The discipline of Technology for creating pedagogical video content tells about the mechanisms and rules for creating digital pedagogical content: presentations, video lectures, audio podcasts and other information resources, as well as working in the LMS.

The subject of Data analysis and interpretation in pedagogy afford to study the methods of statistical analysis and big data analysis, as well as the mechanisms of interpreting the results obtained.

The discipline Digital tools of project activity in the educational process afford to learn about software that can be used to develop and create projects, to track their implementation and manage them, as well as software that allows you to implement flexible approaches to project management.

The STEAM-learning discipline provides information about the mechanisms for creating, developing and implementing interdisciplinary approaches in the educational process.

The subject of the Use of augmented and virtual reality in the educational process tells about the mechanisms for improving the efficiency of the educational process using virtual and augmented reality equipment and software.

The discipline Development of individual educational routes is designed to study the algorithm for creating individual educational trajectories and digital tools that can be used in planning.

The subject of Digital technologies in the educational process provides general information about the use of various means of searching, collecting, analyzing, storing, visualizing and presenting data.

The discipline of developing, creating and promoting online educational courses afford to master the basic digital tools, as well as the rules for creating, placing and promoting your own online courses.

The subject of Digital tutoring in the educational process tells about digital tools that can be used by tutors during the educational process.

The discipline Development of the digital educational environment provides competencies in the field of developing your own model of the digital educational environment.

Educational practice: research practice is aimed at improving the competence of students in the field of practical scientific research in the field of digitalization of the educational process.

Production practice: pedagogical practice is a place for implementing students ' own digital solutions in the educational process.

The implementation and defense of the final qualification work implies the study of the effectiveness of the practical implementation of digital solutions by students in the educational process.

3 Conclusions

As a result of the conducted research, the pool of the most necessary competencies for the teacher for the effective implementation of the mixed learning model was determined according to the stakeholders. This list includes the following groups of competencies: information search, work in office applications, information processing and interpretation, statistical data processing, ability to work with projects, ability to visualize data, ability to use interactive tools, including virtual and augmented reality, ability to work in social networks and messengers, ability to use video conferencing tools, ability to create educational video content and make digital decisions in the educational process.

Based on the results obtained, a digital competence model of the graduate of the educational program "Digital Pedagogy" was developed, which is based on the digital components of universal and general professional competencies, as well as developed special and additional professional competencies.

Based on the developed competence model, the curriculum of the educational program was developed, which takes into account all the basic needs and wishes of stakeholders. The start of the educational program is scheduled for October 2021.

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