# SETTING UP A DIGITAL LEARNING ENVIRONMENT IN A PEDAGOGICAL UNIVERSITY

## ESTABLECER UN ENTORNO DE APRENDIZAJE DIGITAL EN UNA UNIVERSIDAD PEDAGÓGICA

## ESTABELECENDO UM AMBIENTE DE APRENDIZADO DIGITAL EM UMA UNIVERSIDADE PEDAGÓGICA

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**Resumo:** Este artigo tem como objetivo descobrir as particularidades de desenvolvimento do sistema de gerenciamento de universidades digitais da Rússia na Rússia no contexto da digitalização universal e identificar as oportunidades para o desenvolvimento de elementos do ambiente de aprendizado digital das universidades. O principal método de pesquisa da questão é uma análise comparativa do nível de competências digitais de estudantes de educação profissional na Rússia e nos estados membros da União Europeia. Os autores do artigo descobriram as particularidades dos processos transformacionais da educação moderna, revelaram o papel principal do desenvolvimento das tecnologias da informação e da comunicação, determinaram o lugar da Rússia no espaço de aprendizado mundial e analisaram a dinâmica da posição das instituições de ensino superior russas no país. a classificação mundial da universidade.

**Palavras-chave:** Instituição de ensino superior digital; Espaço de aprendizado; Competências digitais; Tecnologias de comunicação da informação; Gestão de universidade digital.

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**Abstract:** This article is aimed at discovering the development particularities of the digital Russian university management system in Russia in the context of universal digitalisation, and identifying the opportunities for the development of university digital learning environment elements. The leading research method of the issue is a comparative analysis of the level of digital competences of students of professional education in Russia and the European Union member states. The authors of the article discovered the particularities of modern education transformational processes, revealed the main role of the development of information and communication technologies, determined the place of Russia in the world learning space and analysed the dynamics of the position of Russian higher educational institutions in the world university rating.

**Keywords:** Digital higher educational institution; Learning space; Digital competences; Information communication technologies; Digital university management.


**Resumen:** Este artículo tiene como objetivo descubrir las particularidades de desarrollo del sistema digital de gestión de la universidad rusa en Rusia en el contexto de la digitalización universal, e identificar las oportunidades para el desarrollo de elementos del entorno de aprendizaje digital universitario. El principal método de investigación del tema es un análisis comparativo del nivel de competencias digitales de los estudiantes de educación profesional en Rusia y los estados miembros de la Unión Europea. Los autores del artículo descubrieron las particularidades de los procesos de transformación de la educación moderna, revelaron el papel principal del desarrollo de las tecnologías de información y comunicación, determinaron el lugar de Rusia en el espacio de aprendizaje mundial y analizaron la dinámica de la posición de las instituciones de educación superior rusas en La calificación de la universidad mundial.

**Palabras clave:** Institución digital de educación superior; Espacio de aprendizaje; Competencias digitales; Tecnologías de la información y comunicación; Gestión de la universidad digital.

## Introduction

The present days are characterized by a radical modification of the learning environment, expressed in the following main tendencies: the transition to mass higher education, which dictates the need for a differentiated approach to building a higher education system with an increased number of levels as well as expanding the methods for obtaining it; the transformation of education into a continual exponential growth process of new content knowledge and, as a result, the need for ongoing updating of employees' knowledge and competences; the development of distance education on the basis of using information and communication technologies; globalization, etc. The main threat of the digitalization of education for our country is to be on the periphery of the global learning environment (Ustyuzhanina & Evsyukov, 2018).

Higher educational institutions must timely respond to the challenges of the external environment, primarily, by creating a digital learning environment. The Federal Project "Digital Learning Environment" as part of the national educational project is aimed at the creation of a

modern and safe digital learning environment by 2024 that provides high quality and accessibility of education of all kinds and levels (Decree of the President of the Russian Federation, 2018).

According to the Federal Law "On Education in the Russian Federation", the electronic information educational environment includes the following elements: electronic information resources, electronic educational resources, the combination of information technologies, telecommunication technologies, relevant technological means that let students fully master the educational programs wherever they are (Federal Law, 2012).

The digital learning environment helps to connect learners and educators in the global digital space that is important for the development of professional abilities needed in the digital world. In this case education becomes socially oriented, and the university learning environment should become a mobile digital space that can be easily integrated with all the workflow of all the parties involved in the global digital learning system (Nikolaeva, 2017).

The university learning environment can become a generator, conductor and integrator of knowledge if it is dynamic, saturated, strives to evolve and to be able to respond to external and internal changes (Afanasyeva & Zyablov, 2018).

**Research Methodology**

**Research Methods**

The following methods were used in the research process: theoretical, empirical, structural and system analysis, statistical-economic methods, methods of expert assessment, general scientific methodology.

Theoretical methods (analysis, synthesis) helped to identify the structural elements of digital university management, to consider the selected components of the educational environment in their unity, to present the factor system of the creation and development of the digital learning environment of the higher educational organization.

The mechanism of development of the digital university learning environment was revealed on the basis of the historical and logical method, the objective process of the society development, and the progressive technologies.

The induction method was used to generalize economic and social facts in order to organize research works on testing the model of the modern digital learning environment. The

process of deriving a set of fundamental terms that form the basis of the requirements and recommendations for the creation and use of the digital learning environment was carried out by the deduction method.

The empirical methods have created the basis for the development of a range of measures of the development of the university electronic information and learning environment through studying and systematizing the best digitization practices in all the spheres of Russian and foreign higher educational institutions, interviewing scientific and pedagogical employees, observations and student interviews.

**Research Experimental Base**

The pilot testing on the study of the issues of the creation and development of the digital higher educational institution learning environment was carried out on the basis of the Federal State Budgetary Educational Institution 'I.Y. Yakovlev Chuvash State Pedagogical University'.

**Research Stages**

The research was carried out in several stages:

Stage 1: A detailed analysis of the regulatory basis, statistical data and research results was carried out. On the basis of the results, theoretical and practical research aspects are identified; the problem, objective and research methods are selected, the research plan is drawn up;

Stage 2: The tendencies of modern education are revealed, the main role of the development of information and communication technologies is identified, the place of Russia in the world learning space is determined and the dynamics of the position of Russian higher educational institutions in the world university international ratings is analysed;

Stage 3: The level of development of digital skills of Russian students of tertiary education was analysed; the Internet activity of students in Russia and EU member states was compared. It helped to identify the reasons for the low level of digital competences development defined by the Federal State Educational Standard.

Stage 4: The work on the development of the digital university learning management system was conducted, the work processes in which digitalization helps to optimize the

activities and save the resources of the university were highlighted. It helped to improve the quality of educational services through including all the working links of the learning process.

Stage 5: The issues of using social networks as one of the elements of the pedagogical university digital learning environment were identified, recommendations for promoting the university with the help of social media were elaborated. The experimental work was completed; disadvantages in the process of creation and development of the university digital learning environment were identified, prospects for its development were defined; theoretical and practical conclusions were drawn, and the final results were generalized and systematized.

**Results And Discussion**

**Russia in Modern World Learning Space**

Education is a key aspect of any society, the most important source and resource of its sustainable development. It is the level of quality of education that motivates the development of science and culture, intelligence and spirituality, the development of the economy, civil society and other fundamental social benefits (Saurenko, 2011). This is a unique mechanism for transferring and assimilating scientific information, professional experience from generation to generation, personal development and individual worldview. New needs appear because of the constant social changes, that is why the educational system also undergoes some changes. The modern stage of the development of the competence-based approach demands great knowledge as well as a university graduate's skills and abilities, i.e. the competences and characteristics of future labour market participants. Within the sixth technological paradigm, our knowledge of nano- and information technologies comes first.

Nowadays our country demonstrates a relatively low share of the digital economy of the whole GDP in comparison with the developed countries. From 2008 to 2017, Russia moved from the 49th to the 45th place in the country ranking. The calculation of the average annual growth rate of the development index of information and communication technologies, as the geometric mean growth coefficients, was as follows: 102,03% - in the leading countries, 106,94% - in Russia (Ilyina, Gorshkova & Grigorieva, 2019).

The educational system is affected by information technologies as well as by geopolitical, demographic, technological, socio-economic factors, etc. (Nazarova, 2018). Therefore, the following main tendencies of the educational development are distinguished:

democratization, globalization, humanization, humanitarisation, continuity, growth in duration, and informatization of education. Informatization includes an active implementation of new teaching tools and methods focused on the use of information technologies, the synthesis of traditional and computer education, the creation of the national information learning space, and on the development of a continuous education system as a universal form of activity focused on the life-long personal development (Strukov, 2009).

The following radical transformations can be observed in the Russian higher education system:

− transformation of educational organizations into scientific and educational complexes;

− transition to mass higher education;

− transformation of education into a continuous process as a result of the exponential growth of the volume of new knowledge and, as a consequence, of the need for constant updating of knowledge and the competences of employees;

− commercialization of the educational system by expanding the range of paid services and changing the ways of its budget financing (Ustyuzhanina & Evsyukov, 2018).

The priority goal of developing the country's information society is the formation of national technological platforms for online education and the opportunity for citizens to receive online education (Decree of the President of the Russian Federation, 2017; Priority project passport, 2016).

Russia is also involved in the process of international competition in the market of educational services in the field of higher education. The competitiveness of the university in the global market for educational services is determined by its position in international rankings. Analysis of the activities of higher educational institutions is based on 13 indicators. The main evaluation criteria are international student and teacher mobility, the number of international scholarship programs, the level of scientific research, contribution to innovation, citation of scientific articles, and the level of educational services. The position of Russian universities in 2012-2019 has been strengthening (according to The Times Higher (THE) Education World University Rankings) (2019) (Table 1).

**Table 1:** Rating of Russian universities (2019) according to The Times Higher (THE) Education World University Rankings (2019)

| Year | Category (place in the rating) |
|------|-------------------------------|

|  | 200 | 201-250 | 251-300 | 301-350 | 351-400 | 401-500 | 501-600 | 601-800 | 801-1000 | 1000+ |
|---|---|---|---|---|---|---|---|---|---|---|
| **2012** | - | - | 1 | - | 1 | - | - | - | - | - |
| **2013** | - | 2 | - | - |  | - | - | - | - | - |
| **2014** | - | 1 | - | - | - | - | - | - | - | - |
| **2015** | 1 | - | - | 1 | - | - | - | - | - | - |
| **2016** | 1 | 1 | 3 | - | - | 2 | 2 | 4 | - | - |
| **2017** | 1 | - | - | 1 | 1 | 5 | 2 | 2 | 12 | - |
| **2018** | 1 | - | 1 | 1 | 1 | 4 | 2 | 3 | 5 | 9 |
| **2019** | 1 | - | 1 | 1 | 1 | - | 5 | 4 | 4 | 18 |

From 2012 to 2019, the number of Russian universities in the world ranking increased from two to thirty-five. The ranking includes metropolitan universities, research institutes and regional universities, such as Voronezh State University, Volgograd State Technical University, Perm State University and others, whose results have secured their positions among the top 1000 universities in the world.

It is worth noting that, according to RUR-2019, Russia ranks second in terms of the number of universities, giving place only to the United States (World University Rankings RUR, 2019).

**The Formation of Digital Skills of Students in Russia and Abroad**

Realization of the project objectives of the digital educational environment requires the use of innovative pedagogical technologies based on the use of computer tools, Internet resources, and software. These technologies today include: adaptive, cloud, mobile, mixed, reverse learning, e-learning, etc. These technologies can enhance the educational process, increase its correlation with the individual needs of students, their interests, level of knowledge, professional experience and educational goals (Avadayeva et al., 2018).

Universities in the implementation of educational programs use various software tools (table 2).

**Table 2:** The use of software in higher educational institutions, as a percentage of the total number of higher educational institutions; at year end (Indicators of digital economics, 2019)

| Software | Year 2016 | Year 2017 | Pace of change (+, -), % |
|---|---|---|---|
| Content filtering tools for Internet access | 78,5 | 81,8 | +4,20 |
| Electronic document management systems | 76,3 | 78,8 | +3,28 |
| Virtual simulators | 48,9 | 50,5 | +3,27 |
| Special software tools for solving organizational, managerial and economic problems (excluding automated document management systems) | 83,9 | 86,5 | +3,10 |
| Special research software | 55,6 | 57 | +2,52 |
| Educational computer programs in specific subjects or topics, specialization software packages | 87,4 | 89,3 | +2,17 |
| Electronic library systems | 93,9 | 95,8 | +2,02 |
| Electronic legal reference systems | 90,8 | 92,6 | +1,98 |
| Electronic versions of training manuals for specific subjects or topics | 91,5 | 93,3 | +1,97 |
| Computer testing programs | 86,3 | 87,7 | +1,62 |
| Electronic versions of directories, encyclopedias, dictionaries, etc. | 90,6 | 91,7 | +1,21 |

Depending on the rate of change in the use of software tools, in the table above they are listed in descending order. Analysis of the table data allows us to conclude that:

1) universities are increasing the pace of use of all types of software;

2) the means of content filtering of Internet access, electronic document management systems and virtual simulators are most widely and frequently used;

3) the most popular software tools used by universities in the educational process are: electronic library systems (EBS), electronic versions of textbooks on specific subjects or topics and electronic reference and legal systems (EPS);

4) the smallest share in the number of used software is virtual simulators and special software for scientific research.

The popularity of EBS and ESPS is explained by the obligation of an educational organization to carry out training in accordance with Federal State Educational Standards that impose system-wide requirements and requirements for material, technical and educational-methodological support of an educational program.

The main digital competences necessary for the implementation of their professional functions include:

1. Skills of working with application programs - work with a text editor; work with spreadsheets; creation of electronic presentations using special programs; use of programs for editing photo, video and audio files; self-writing of software using programming languages.

2. Skills of working with digital equipment - transferring files between a computer and peripheral devices; connection and installation of new devices; changing of settings or software configuration settings; installing or reinstalling an operating system; downloading software (other than computer games).

3. Communication skills in the digital environment - sending or receiving e-mails; phone calls or video calls over the Internet; uploading personal files to websites, social networks, cloud storage for public access.

4. Skills in working with digital information - performing a search for information about goods and services or searching for information related to health or health services (Bondarenko et al., 2019).

Let us analyze the possession of at least one of the listed skills for working in a group of skills by professional education students and employees aged 25-64 (table 3).

**Table 3:** Digital competences among students of secondary and higher education programs and those employed: 2017, percent (Bondarenko et al., 2019)

| Digital competences | Students | | Employed, aged 25–64 | |
| --- | --- | --- | --- | --- |
| | Secondary vocational education | higher education | mid-level specialists | High qualified specialists |
| **Application skills** | 83 | 89 | 70 | **86** |
| **Digital equipment skills** | 57 | 66 | 44 | **54** |
| **Communication skills in the digital environment** | 74 | 85 | 70 | **81** |
| **Skills for working with digital information** | **42** | **55** | **64** | **69** |

The average values of digital competences show that students have more skills in digitalization than employees, both higher education students and specialists of higher qualification have more advanced digital competences than secondary students and mid-level specialists. It is interesting that most mid-level specialists and most secondary education

students are not able to handle digital information and lack the skills of working with digital equipment. The respondents mostly include people with skills in working with application programs.

Let us analyze the totality of digital skills among students of secondary vocational and higher education (table 4).

**Table 4:** Basic and advanced digital competences of students of secondary and higher professional education: 2017, percent (Bondarenko et al., 2019)

| Digital competences | Secondary vocational education | Higher education |
|---|---|---|
| **Using a set of basic skills:** | | |
| **Work with application programs** | 17 | 24 |
| **Work with office applications** | 25 | 33 |
| **Communication in the digital environment** | 18 | 27 |
| **Work with digital information** | 10 | 16 |
| **Using selected in-depth skills** | 29 | 39 |

Students receiving higher education demonstrate a higher level of proficiency in all types of skills, that is, an average of 27.8% of university students, which is 8% higher than the rate of secondary vocational students, they are able to perform all types of work with applied programs, with office applications , digital information, communicate in a digital environment. Also, 10% more university students have at least one of the advanced digital skills: independent writing of software using programming languages; connection and installation of new devices; changing settings or software configuration settings; installing or reinstalling an operating system; downloading software (other than computer games).

It is interesting to compare the Internet activity of Russian and European students. The comparison will be carried out in general with the countries of the European Union and with Finland, Germany, Italy and Bulgaria in particular (table 5).

**Table 5:** Internet activity of students of secondary vocational and higher education programs in Russia and European Union member countries: 2017*, percent (Bondarenko, et al., 2019)

| Types of Internet activity | Russia | EU countries ** | Of them | | | |
|---|---|---|---|---|---|---|
| | | | Finland | Germany | Italy | **Bulgaria** |

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| | | | | | |
|---|---|---|---|---|---|
| **Sending or receiving email** | 55 | 88 | 99 | 93 | 76 | **84** |
| **Participation in social networks** | 88 | 88 | 96 | 86 | 80 | **94** |
| **Participation in professional social networks (E-xecutive.ru, etc.)** | 3 | 16 | 21 | 13 | 13 | **4** |
| **Job search** | 14 | 27 | 68 | 39 | 17 | **14** |
| **Distance learning** | 12 | 13 | 51 | 9 | 7 | **9** |
| **Search for information about goods and services** | 48 | 76 | 94 | 88 | 51 | **65** |
| **The implementation of financial transactions (Internet banking)** | 23 | 44 | 79 | 42 | 24 | **3** |
| **Average value** | **34,7** | **50,3** | **72,6** | **52,9** | **38,3** | **39,0** |

\* Over the last 3 months at the time of the survey.
\*\* For countries of the European Union - students aged 15 and older.

On average European students are more active on the Internet than Russian students, students have the same levels of activity only in terms of participation in social networks. The highest rates of Internet activity are among Finnish students, the lowest are among Russian students, although distance learning is more widely used by Russian students compared to Germany, Italy and Bulgaria. It is important to pay attention to the low level of student participation in professional social networks, only 3% of Russian students are interested in relevant information on their professional sphere.

The low level of formation of digital competences of students is partially caused by the low level of requirements of the Federal State Educational Standard (FSES) of tertiary education. FSES on secondary vocational education within the framework of the Specialization Module 44.00.00 Education and Pedagogical Sciences provides for two general competences, including general professional competence GPC-4 (ability to search, analyze and evaluate the information necessary for the formulation and solution of professional tasks, professional and personal development) and GPC-5 (ability to use the information and communication technologies to improve professional activities (Federal portal of Russian education, 2019).

According to the Federal State Educational Standard of Higher Education for Undergraduate Studies within the specialization 44.03.01 Pedagogical Education provides for two competences, universal and general professional, providing for the formation of the ability to work with information resources (table 6).

**Table 6:** Universal and general professional competences of the graduate of pedagogical training (Order of the Ministry of Education and Science of Russia, 2018)

| Name of the category (group) of competences | Code and name of competence of the graduate |
|---|---|

| Systemic and critical thinking | UK-1. Able to search, critical analysis and synthesis of infoyuqtion, apply a systematic approach to solving the tasks |
|---|---|
| Development of basic and additional educational programs | PC-2. Able to participate in the development of basic and additional educational programs, to develop their individual components (including using information and communication technologies) |

As a rule, universal competences are formed by a single set of subjects for all profiles of pedagogical training within the framework of the social and humanitarian, communicative, psychological and pedagogical module, all types of practices and during the state final certification. The features of the orientation (profile) of the educational program are manifested in the subject-methodological module in the formation of the ability to search, critical analysis and synthesis of information. General professional competence is formed by the subjects of the subject-methodological module, all types of practices and state final certification. The educational professional higher education program provides for one discipline "Informatics and information and communication technologies", in which students purposefully acquire digital skills. The lack of hours to work with software products, digital information helps to fill the electronic information and educational environment of the university.

**Modeling the Digital Learning Environment of the University**

Digitalization of the educational environment of the university helps to organize all the work processes of the university:

1. Organization of the educational process – the development of curricula and their implementation, student enrollment, scheduling, etc.

2. Administrative and research activities - procurement, contracts, property management, custom work on the research work of the university.

3. Supporting processes – financial accounting, human resources, access control and physical security systems, etc.

Digitalization allows you to adhere to a number of trends that are relevant for universities today in connection with the requirements of regulators:

1. Fulfillment of Federal State Educational Standards of Higher Education, mandatory requirements for the organization of educational activities.

2. Cybersecurity: ensuring the protection of university information assets, including personal data of employees.

3. Transfer to an effective contract of scientific and pedagogical workers: the contracts allow for the implementation of remuneration taking into account KPI, which, in addition to the academic load, includes the results of scientific work, organizational and methodological, educational and other kinds of work.

The mission of a digital university is to radically improve the quality of the educational process by including all the links of the educational process, research and management in a single educational environment and the use of modern educational technologies. The advantages of a digital university are the improvement of the quality of education, the organization of a single information space, the rapid collection of relevant data characterizing the state of all areas of the university's activities, providing access to educational resources from any mobile device, and anti-terrorism security (Bryunin, 2018).

The digital educational environment is capable of providing access to electronic educational resources, electronic library systems, conducting online classes, recording the course and results of educational activities, etc. (Ilyina et al., 2019).

A single digital information environment can (and should) support the continuous process of innovative transformations in the work of a university (Karakozov, Suleymanov & Uvarov, 2014). The unified integration of informatization tools of higher pedagogical education into a single information educational environment should be carried out taking into account the specifics of using information technologies in various fields of activity of a pedagogical university (Atanasyan, 2009).

Now consider the digital management system of the university on the example of the I.Y. Yakovlev Chuvash State Pedagogical University (Figure 1).

**Elements of a university digital control system**

| Educational process managment |
| Research managment |
| Library managment |
| Electronic document managment |
| Purchasing managment |
| Business planning |
| Student portfolio |
| Rector's mobile office |
| Resource center (RC) |
| University portal |
| Staff and salary |
| Admission committie |
| Distance learning system |
| Student employment system |
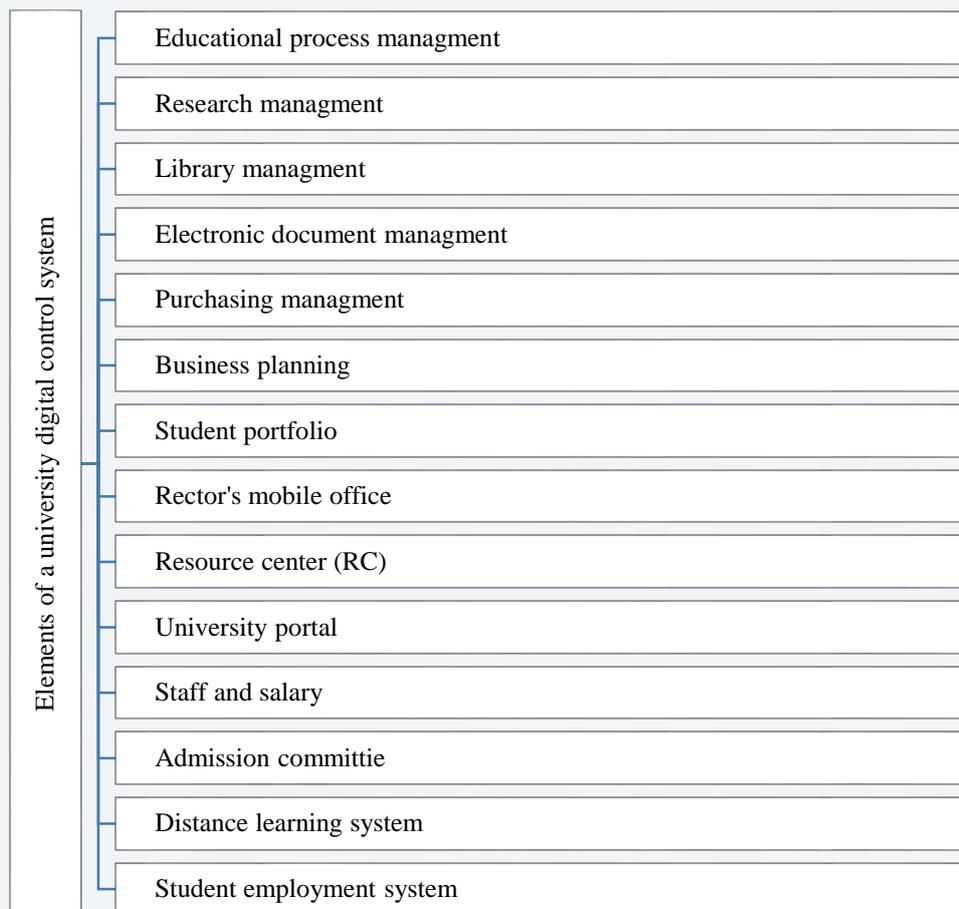
**Figure 1:** Elements of a university digital management system

1. Management of the educational process.

To manage the educational process at the university, we use the following program package, developed by the Laboratory for Mathematical Modeling and Information Systems:

1.1. The software package "Plans". This system allows you to create a unified system of automated planning of the educational process. Curricula are fully compatible with the format used in the process of state accreditation.

The software "Subject working programs" is part of the package "Plans" and is intended for the preparation of documents of the same name based on curricula. Documents are stored in a database and can be output in electronic or printed formats for transfer to library funds or for provision to students. They can also be used for presentation to experts in the field of educational content in the implementation of introspection or accreditation procedures.

1.2. Information system "Dean's office", which allows you to effectively manage a database of students. It is intended for managing students' personal files, allows automating management of study groups, areas of study, specialties, creating students' electronic personal

files, carrying out student movements: transferring students to another group, enrolling, expelling and recovering, providing academic leave, etc.

1.3. The software package "Electronic Journal" is intended for accounting and analysis of student performance; it is a computer analogue of the test report in paper form.

1.4. AS "University Load" provides an integrated approach to the formation and distribution of the academic load of higher professional education organizations. The system is designed to work on a local network and has three access levels that determine the functionality available to users.

1.5. The program «Diploma Master». The program is integrated with the subsystems «Dean», «Electronic statements» and «Plans». If the database contains student lists, grades or curricula, the program allows you to automatically import all available information, speeding up the preparation of diplomas. The program can also work autonomously, enabling you to enter all the information necessary for printing a diploma and save the data in a file.

2. Management of research activities.

In this area of the university, various third-party information systems are used. One of them is the Unified State Information System for the Accounting of the Results of Scientific Research, Development and Technological Work for Civil Purposes. It is intended:

- to account for data on research and development in all areas of knowledge in the Russian Federation;
- to provide information to all interested parties about the results of scientific research, experimental design and technological work;
- to use the results of intellectual activity.

3. Library management.

The university's library uses two systems: the MegaPro Pro Automated Integrated Library System and the IPRbooks Electronic Library System.

AILS «MegaPro» is intended for the integrated automation of information and library activities. At the university, using this AIBS, an electronic catalog of the library is formed. Access to the catalog is carried out using a library card number.

ELS «IPRbooks» is a database that includes more than 23,000 publications, including the possibility of publishing electronic editions of university teachers.
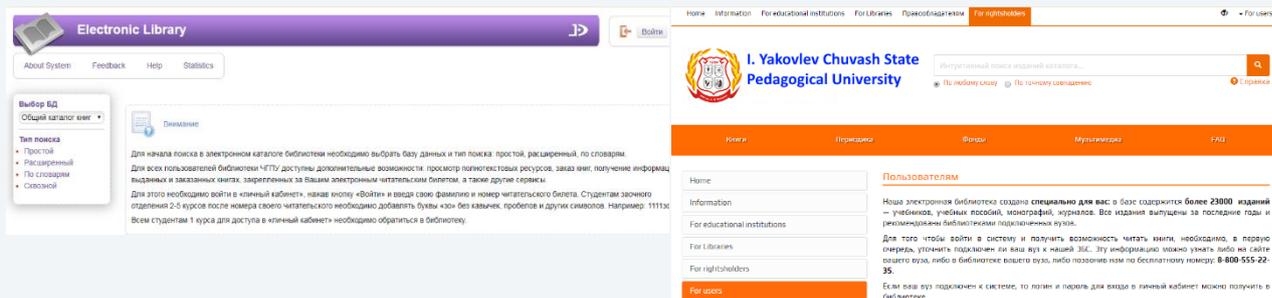
**Figure 2.** LMS «MegaPro» and ELS «IPRbooks»

4. Procurement management.

The department of procurement of the university carries out its work using the Unified Information System in the field of procurement.

5. Electronic document management.

At this stage of the university's work, document management was implemented using several components: internal e-mail inmail.chgpu.edu.ru, e-mail chgpu.edu.ru and project management system bitrix24.ru. Electronic signatures are not used in this document flow.

Electronic keys for signing official documents and authorization on some official portals and resources (procurement, portal of government bodies, etc.) are available only to managers and some university employees.

In the future, it is planned to use electronic signatures for internal workflow (statements, memos, etc.).

6. Planning of financial and economic activities.

The accountant department uses the program «1C: Accountancy in a state institution» to maintain full accounting records.

7. Student portfolio.

The electronic university student portfolio is implemented on the basis of the Internet extension, which is a website connected to the database of the IS (Information System) «Dean's office», «Electronic reports», «Plans».

Students have access to a personal account where they can fill out their portfolios and upload information about their achievements in academic, scientific and other activities.
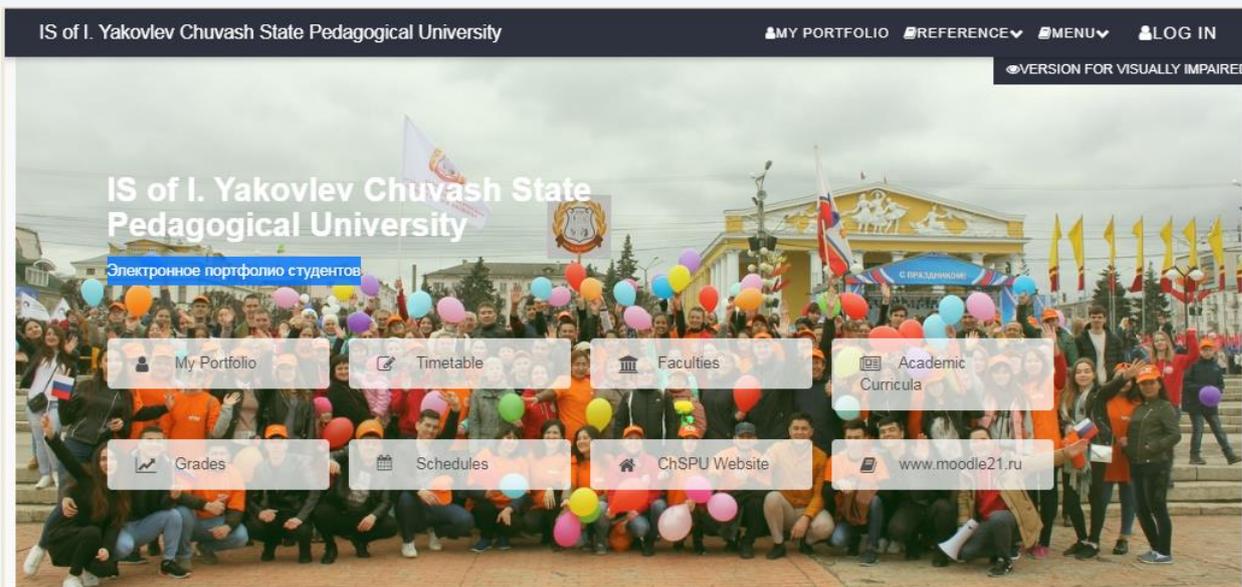
**Figure 3.** Electronic student portfolio

8. President's mobile office.

The university president's mobile office is implemented on the basis of the Bitrix 24 project management system and its mobile version, which allows the president to be in touch with all the employees of the university.

In addition, an electronic reception has been implemented on the university website, which allows asking a question to the president of the university, vice-rectors and heads of structural units of the university.

9. Information resource center (IRC).

The university has created the Office of Information and Technology Support for Education, which provides the organization and management of the process of IT penetration in accordance with the development program, the concept of IT penetration, the objectives of the university; continuous functioning of the software and hardware complex and the telephone network of the university; the development and application of new software and hardware, information technology in education, the accumulation and systematization of general and thematic application software, etc.

10. University portal.

The university has implemented a Unified Information Learning Environment, including the official website of the university, an educational portal, an electronic portfolio website, a library website and e-library systems.

The university website contains all relevant information on the university activities: news, documents, orders, reports, etc., corresponding to the requirements for the structure of

the official website of the educational organization in the information and telecommunication network «Internet» and to the format for presenting information on it (Order of the Federal Service for Supervision of Education and Science, 2014).

The educational portal of the university is implemented through the Moodle course management system. The portal www.moodle21.ru contains all the necessary information on the organization of the educational process: academic course working programs, training courses for teachers.

The library website and e-library systems provide access to the database of educational literature necessary for students and teachers.

11. Personnel and salary.

The Office of Personnel and Legal Support Management and the Office of Accounting and Financial Control use the program «1C: Accountancy in a state institution» for their work.

12. Enrollment campaign.

The automation of the activities of the enrollment board is implemented through the information system (IS) «Enrollment Board» of the Laboratory of Mathematical Modeling and Information Systems. The system enables users to:

1) create an electronic applicant student's personal data file;

2) take into account the results of entrance tests;

3) check documents in the federal database of USE certificates;

4) form examination groups;

5) create examination record lists;

6) create a consolidated enrollment list;

7) prepare reports.

Since the IS is integrated with the IS «Dean's office», it allows users to transfer applicant student's personal data files into the student database after their enrollment.

13. Distance learning system.

The Adult Education Center of the university posts the necessary information on its website. It posts materials of advanced training courses and professional retraining programs in the Moodle course management system.

14. System of graduate employment.

The «Internet Service for Employment Assistance of the ChSPU» program was developed for the Office of Pre-University Training and Graduate Employment.

The program is designed to create, display and manage the contents of the database containing the following data:

1. Job offers of educational organizations of the Chuvash Republic.

2. Information about the graduates of the ChSPU.

3. Ability to conduct a statistical analysis of the employment of graduates in the context of time and job offers.

The program provides a Web interface for displaying and managing database content in accordance with the requirements of the http/https protocol on the Internet.
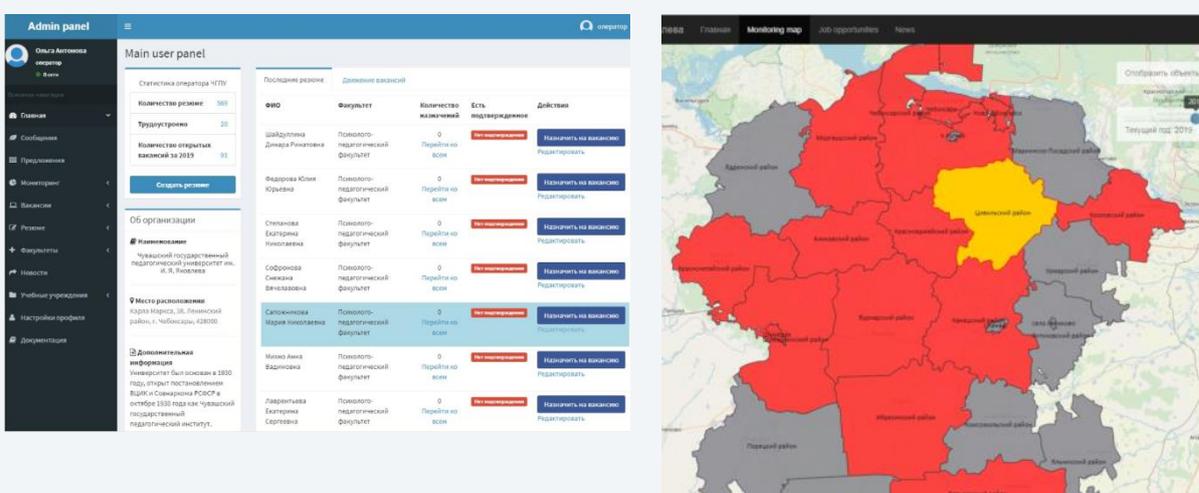


**Figure 4.** Electronic graduate employment system

The program combines a geographic information system for visualizing information with a database system of job offers in schools in the Chuvash Republic and graduate CVs of the ChSPU.

Social networks have become an effective means of managing the educational process with the growing trend of IT penetration in education.

Communities of academic courses arising in the network allow to store, process, transfer educational information, as well as to create student reports on the current status of the training assignment. Equally important tasks of social networks are creating a positive image of the university, forming a corporate environment and informing the contact audience about events at the university.

The main directions of further development of the information activities of the pedagogical university are the following: informing the public, target groups about the additional benefits of the university; updating the official website, its design and functionality; creating a mobile version of the website; group management not only in the social net of

Vkontakte, but also in the popular net of Instagram; increasing consumer content; creating a section on successful students and graduates to increase credibility in the University.

**Prospects for the Development of the Digital Learning Environment of the University**

When designing a university-based electronic information and learning environment, a clear understanding is needed that this is the process of forming a complex, multi-component tool that is necessary for various subjects of educational activity, while each of them solves its specific tasks, therefore, the elements of the electronic information and learning environment should be multifunctional, and its structure is flexible, adaptive, capable of updating to meet the changing requirements of educational standards (Serafimovich, Konkova & Raikhlina, 2019).

The phased implementation of the electronic information and learning environment provides the opportunity for the well-timed preparation of the technical base, personnel, administration system for its effective use in the educational and managerial activities of the University in the future.

Prospects for the development of the electronic information and learning environment as a flexible and variable system, taking into account the needs of society and individual subjects of the educational process, taking into account the specifics of the university, training programs, and individual training courses. The task of the digital learning environment is to promote the sustainable innovative development of every specific university, taking into account trends in the Russian and international educational space.

The further development of the digital learning environment should be associated with the improvement of the regulatory framework, the creation of a unified Russian educational space for constant advanced training of scientific and pedagogical personnel, interaction, professional cooperation and exchange of experience between different regions, with the prospect of developing a world-class virtual social and cultural environment, a professional community portal.

**Conclusion**

In order to summarize it should be noted that Russia is involved in the process of international competition in the market of educational services in the field of higher education.

From 2011 to 2019 the number of Russian universities in world rankings increased due to the enhanced international student and teaching mobility, the number of international scholarship programs, the level of scientific research, etc.

Currently, universities are increasing their use of all types of software, including e-library systems, virtual simulators and special programs for scientific research.

The low level of development of digital competences of students is partly due to the low level of requirements of the Federal State Educational Standard of tertiary education.

Modern universities need to develop all the elements of digital university management, which should be multifunctional, and its structure should be flexible, adaptive, capable of updating to the changing requirements of the environment and educational standards to ensure worldwide competitiveness.

The development of a digital learning environment should be associated with the creation of a unified educational space for professional cooperation and the exchange of experience between different regions.

**REFERENCES**

1. Afanasyeva, G. A. & Zyablov, A. A. (2018). The development of the learning process in a new digital environment. Ecology of urban areas, 2. URL: https://cyberleninka.ru/article/n/razvitie-obrazovatelnogo-protsessa-v-novoy-tsifrovoy-srede.

2. Atanasyan, S. L. (2009). Formation of the information learning environment of a pedagogical university: PhD thesis. Moscow: Institute of Content and Teaching Methods of the Russian Academy of Education.

3. Avadayeva, I. V., Anisimova-Tkalich, S. K., Vezetiu, E. V., Vovk, E. V., Goldenova, V. S., Grebennikova, V. M., Kovtanyuk, A. E., Krechetnikov, K. G., Mantaeva, E. I., Mironov, L. V., Orlova, L. V., Slobodchikova, I. V., Tkalich, A. I., Chernyavskaya, V. S. & Sher, M. L. (2018). Methodological foundations of the development of modern digital learning environment. Nizhny Novgorod: International Journal of Professional Science. URL: http://scipro.ru/conf/monographeeducation-1.pdf.

4. Bondarenko, N. V., Gokhberg, L. M. & Kovaleva, N. V. (2019). Education in numbers: 2019. A Brief Statistical Digest. Moscow: National Research University, Higher School of Economics. URL: https://www.hse.ru/data/2019/08/12/1483728373/oc2019.pdf.

5. Bryunin, A. V. (2018). Digital Higher Educational Institution is the University of the Future. URL: https://softline.ru/uploads/f/ba/d4/25/c1/79/36/6b/ad/98/tsifrovoy-vuz.pdf.

6. Decree of the President of the Russian Federation. (2017). Dated May 9, 2017 No. 203 "On the Strategy for the Development of the Information Society in the Russian Federation for 2017-2030". URL: http://www.consultant.ru/document/cons_doc_LAW_216363/.

7. Decree of the President of the Russian Federation. (2018). Dated May 7, 2018 No. 204 (as amended on July 19, 2018) "On the national goals and strategic objectives of the development of the Russian Federation for the period until 2024". URL: http://www.consultant.ru/document/cons_doc_LAW_297432/

8. Federal Law. (2012). Dated December 29, 2012 No. 273-FL. "On Education in the Russian Federation". URL: http://www.consultant.ru/document/cons_doc_LAW_140174/.

9. Federal portal of Russian education. (2019). Federal State Educational Standards of tertiary education (FES TE) of the new generation. URL: http://www.edu.ru/abitur/act.86/index.php#Par44.

10. Ilyina, E. A., Gorshkova, N. K. & Grigorieva, S. V. (2019). Development of digital educational environment in Russia. Collection of Scientific Articles. Cheboksary: Chuvash State Pedagogical University named after I. Ya. Yakovleva.

11. Ilyina, E. A., Shchiptsova, A. V., Poverinov, I. E., Grigoreva, S. V., Gorshkova, N. K. & Fisunov, P. A. (2019). Features of the Development of the Digital Educational Environment in Russia. *International Journal of Higher Education, 8*(7), 121-131.

12. Indicators of digital economics. (2019). Statistical Digest. Moscow: National Research University of the Higher School of Economics. URL: https://www.h-se.ru/primarydata/ice2019.

13. Karakozov, S. D., Suleymanov, R. S. & Uvarov, A. Yu. (2014). Guidelines for the development of the digital educational environment of Moscow State Pedagogical University. *Science and School*, 6. URL: https://cyberleninka.ru/article/n/orientiry-razvitiya-tsifrovoy-obrazovatelnoy-sredy-moskovskogo-pedagogicheskogo-gosudarstvennogo-universiteta.

14. Nazarova, S. I. (2018). Development trends of the modern education system. *Education Management: Theory and Practice, 1*(29), 268-278. URL: https://cyberleninka.ru/article/n/tendentsii-razvitiya-sovremennoy-sistemy-obrazovaniya.

15. Nikolaeva, E. M. (2017). Organization of the educational process in a new media environment. *Journal of the Saratov University, 17*(2), 162-166. URL: https://cyberleninka.ru/arti-cle/n/organizatsiya-obrazovatelnogo-protsessa-v-usloviyah-novomediynogo-prostranstva.

16. Order of the Federal Service for Supervision of Education and Science. (2014). Dated May 29, 2014 No. 785 "On approval of the requirements for the structure of the official website of the educational organization in the information and telecommunication network "Internet" and the format for the presentation of information on it". URL: https://base.garant.ru/70713570/.

17. Order of the Ministry of Education and Science of Russia. (2018). Dated February 22, 2018 No. 121 "On the approval of the federal state educational standard of higher education - a bachelor's degree in the program of preparation 44.03.01 Pedagogical

education". URL: https://rulaws.ru/acts/Prikaz-Minobrnauki-Rossii-ot-22.02.2018-N-121/.

18. Priority project passport. (2016). Dated October 25, 2016 No. 9 "Modern digital educational environment in the Russian Federation". URL: http://www.consultant.ru/document/co-ns_doc_LAW_216432/.

19. Rating of Russian universities. (2019). "National recognition". URL: https://univer.expert/akademicheskiye-reytingi/obshchiy-reyting-2019/

20. Saurenko, N.E. (2011). Trends in the development of modern education. *Scientific notes of the University of Lesgaft*, 4, 156-161. URL: https://cyberleninka.ru/article/n/tendentsii-razvitiya-sovremennogo-obrazovaniya.

21. Serafimovich, I.V., Konkova, O.M. & Raikhlina, A.V. (2019). The formation of the electronic information and educational environment of the university: interaction, the development of professional thinking, management. Open education, 1. URL: https://cyberleninka.ru/article/n/formirovanie-elektronnoy-informatsionno-obrazovatelnoy-sredy-vuza-interaktsiya-razvitie-professionalnogo-myshleniya-upravlenie.

22. Strukov, E. N. (2019). Modernization of education in the context of the formation of informational competence of students. OTO, 1. URL: https://cyberleninka.ru/article/n/modernizatsiya-obrazovaniya-v-kontekste-formirovaniya-informatsionnoy-kompetentnosti-studentov.

23. Ustyuzhanina, E. V. & Evsyukov, S. G. (2018). Digitalization of the educational environment: opportunities and threats. *Vestnik of the Plekhanov Russian University of Economics, 1*(97). URL: https://cyberleninka.ru/article/n/tsifrovizatsiya-obrazovatelnoy-sredy-vozmozhnosti-i-ugrozy.

24. World University Rankings. (2019). World University Ranking. URL: https://www.timeshighereducation.com/world-university-rankings.

25. World University Rankings RUR. (2019). World University Rankings RUR. URL: http://roundranking.com/ranking/world-university-rankings.html#world-2019.

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