Key knowledge and skills university students need in a digital environment

Tatiana V. Salynskaya
Cand. Sci. (Philol.), Assoc. Prof. at the Foreign Languages Department
ORCID: https://orcid.org/0000-0001-5501-1012, e-mail: salynskayatatiana@mail.ru

Arina A. Yasnitskaya
Senior Lecturer at the Foreign Languages Department
ORCID: https://orcid.org/0000-0002-4184-5355, e-mail: lmtcguu@gmail.com

State University of Management, 99, Ryazansky prospekt, Moscow 109542, Russia
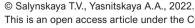
Abstract

The era of digital transformation implies fundamental changes in society, educational processes, professional activities and everyday life of people. This allows building economic relations in a new way, establishing cultural ties, planning, making and implementing decisions. Digital technologies are becoming an important tool for educational transformation and they affect the value of the digital system positively. The purpose of the article is to evaluate the introduction of digital technologies into the system of teaching students at the university. The empirical methods such as questioning, analysis, study and generalization are used in the research. The paper concludes that undergraduate students consider the active introduction of digital transformation into the educational process as a necessary component for acquiring modern digital competencies. The perspectives for the study lie in the introduction of modern digital technologies focused on the widespread use of active teaching methods that contribute to the deepening of the professional specialization of the educational process in the era of the digital economy. The scientific novelty of the paper bases on the fact that the authors examine the impact of digital technologies used in the process of teaching at a university on the degree of students' readiness to enter a new educational space and to participate in the educational process based on the use of information, communication and digital technologies.

Ключевые знания и навыки для профессиональной реализации студентов в цифровой среде

Салынская Татьяна Владимировна

Канд. филол. наук, доц. каф. иностранных языков
ORCID: https://orcid.org/0000-0001-5501-1012, e-mail: salynskayatatiana@mail.ru

Ясницкая Арина Анатольевна

Ст. преп. каф. иностранных языков
ORCID: https://orcid.org/0000-0002-4184-5355, e-mail: lmtcguu@gmail.com

Государственный университет управления, 109542, Рязанский пр-т, 99, г. Москва, Россия

Аннотация

Эпоха цифровой трансформации подразумевает кардинальные изменения в обществе, образовательных процессах, профессиональной деятельности и повседневной жизни людей, что позволяет по-новому выстраивать экономические отношения, налаживать культурные связи, планировать, принимать и реализовывать решения. Цифровые технологии становятся важным инструментом трансформации образования и положительно влияют на ценность цифровой системы. Цель статьи — оценка внедрения цифровых технологий в систему обучения студентов вуза. В исследовании используются эмпирические методы, такие как анкетирование, анализ, изучение и обобщение. В работе сделан вывод о том, что студенты бакалавриата рассматривают активное внедрение цифровой трансформации в образовательный процесс как необходимую составляющую приобретения современных цифровых компетенций. Перспективы исследования заключаются во внедрении современных цифровых технологий, ориентированных на широкое использование активных методов обучения, способствующих углублению профессиональной специализации образовательного процесса в эпоху цифровой экономики. Научная новизна статьи заключается в том, что авторы исследуют влияние цифровых технологий, используемых в процессе обучения в вузе, на степень готовности студентов к вхождению в новое образовательное пространство и к участию в образовательном процессе на основе использование информационных, коммуникационных и цифровых технологий.

Ключевые слова: цифровые технологии, профессиональная деятельность, цифровые среды, цифровые навыки, иностранный язык, знания, коммуникация, образование

Introduction

The most significant element in the contemporary changes in society is the process of digitalisation. Digital technologies are the effective elements in all main areas of human life. The tasks of digitalisation are to ensure the stable functioning of the system in any conditions and the possibility of rebuilding the main processes as quickly as possible without involving human and financial resources [Bolgova et al., 2021]. Over the past 30 years a strengthening of the digital economy has taken place; it is based on the growth of global markets, accompanied by new organizations of work, production and trade. Digitalisation processes take various forms. Many aspects of society are organized and managed to a large extent through digital systems, services and applications. The systems of education, healthcare, social security are currently being rebuilt in many countries in accordance with digital principles. Government services are increasingly provided and administered online in the form of e-government, e-health and e-social security.

The terms "digital skills" and "digital competencies" refer to a range of different abilities, many of them are not only "skills", but also a combination of behaviour, experience, habits, inclinations and critical understanding.

The economic situation in the Russian Federation is linked with the state of affairs in education, which is becoming the main source for solving strategic problems [Zeer et al., 2021]. Obviously, that education is a key building block for developing digital skills and competencies. Digital skills and competencies are an area of education that is constantly changing in tandem with the development of new technologies. For these purposes, the federal project "Personnel for the Digital Economy" of the national program "Digital Economy of the Russian Federation" is being implemented[1]. The development of digital skills occurs at all levels of education: from school, colleges and up to the university.

The key competencies of the digital economy should closely interact with the competencies included in the Federal State Educational Standard for Higher Professional Education[2]. Within the framework of this direction, educational and methodological complexes have been developed that ensure the successful solution of this problem. The educational modules of higher education were developed, which are aimed at the formation of competencies in various branches of the economy in the context of information technologies (IT) and digitalisation. These models are noticed in the field of information and communication technologies; in healthcare; in the industrial sector; in transport and logistics; in the field of green technologies and resource saving; in the field of education; in the social sector.

According to the strategy of digital transformation of science and higher education developed by the Russian Ministry of Science and Higher Education, the key competencies in the digital economy are[3]:
• communication and cooperation in the digital environment (this competence means that a person has the ability to use various digital tools in the digital environment, it helps to achieve the set goals in interaction with other people);
• self-development (this competence implies the ability of a person to set educational goals for himself under emerging life tasks, to select ways to solve and develop other necessary competencies);
• creative thinking (this competence implies a person's ability to generate new ideas for solving problems of the digital economy, to abstract from standard models);
• information and data literacy (this competence means that a person has the ability to perceive, analyze, memorize and transmit information using digital means, as well as using algorithms when working with data obtained from various sources in order to effectively use the information received for problem solving).

The transition to a digital economy requires a change in a key element – education. Consequently, the formation of digital competence is becoming one of the most important tasks of the vocational education system [Dolgikh, Pershina, 2019]. Universal digital competence is introduced into educational standards, which makes it possible to acquire knowledge, skills and abilities, enabling graduates to use information resources and information and communication technologies to achieve goals related to professional activities and active participation in the life of modern society. The main task of higher education is to prepare graduates so that they can independently form the competencies that will become in demand during their professional life.

The introduction of digital technologies entails serious transformations in the field of needs for modern and professional specialists:

---

[1] The Ministry of Digital Development, Communications and Mass Media of the Russian Federation, *National program "Digital economy of the Russian Federation"*, available at: http://static.government.ru/media/files/urKHm0gTPPnzJlaKw3M5cNLo6gczMkPF.pdf (accessed 30.06.2022).

[2] *Order of the Ministry of Economic Development of the Russian Federation dated 24 January 2020 No. 41 "On approval of methods for calculating indicators of the federal project "Personnel for the Digital Economy" of the national program Digital Economy of the Russian Federation",* available at: https://rulaws.ru/acts/Prikaz-Minekonomrazvitiya-Rossii-ot-24.01.2020-N-41 (accessed 30.06.2022).

[3] The Ministry of Science and Higher Education of the Russian Federation, *Strategy for digital transformation of science and higher education, available* at: https://www.minobrnauki.gov.ru/upload/iblock/e16/dv6edzmr0og5dm57dtm0wyllr6uwtujw.pdf (accessed 30.06.2022).

• the disappearance a number of specialties from the market;
• the changes in the set of competencies for some profiles;
• the emergence of new professions;
• the increasing requirements for graduates of higher educational institutions;
• the changing in requirements for "soft skills";
• the growth of market demand for young professionals with digital competencies.

The Russian labor market is expected to grow in demand for qualified IT personnel. Therefore, the educational process must also change for a consistent transition to a personalized and result-oriented digital space [Basharina, 2020] with the active introduction of individual educational trajectories and new formats for assessing competencies.

At the federal level, Strategy for digital transformation of science and higher education and the Digital educational platform[4] of the Ministry of Digital Development, Communications and Mass Media of the Russian Federation and the Ministry of Science and Higher Education of the Russian Federation are intended to solve the problems of digitalisation. The Strategy for digital transformation of science and higher education provides subsidies for the development of human resources, material and technical base, and the Digital educational platform — the issuance of grants for the creation of centres for the development of transformation models in the universities. The key aim of the digitalisation of education in Russia is to integrate digital technologies into the educational process so that they interact with each other [Andryukhina et al., 2020]. The creation of a "digital university" is explained by the demand for the use of digital communications by graduates, the growing competition between leading universities that master digital learning technologies [Brodovskaya et al., 2020].

The systematic use of information technologies in higher education is a requirement of the time, since digitalisation has covered all areas of modern society, and knowledge of foreign languages has become an urgent need for modern specialists [Aksenov et al., 2021]. Building a new paradigm of education, it is significant to analyse the image of a modern student. They grew up in the modern information environment and possess the skills that give them access to the whole variety of educational resources and technologies. Consequently, the active use of digital educational resources by students in the study of foreign languages increases the effectiveness

of learning. It is effective to use digital technologies, problem-based, project-based and communicative learning to immerse students in the professional field of their specialty and create a real digital information product for solving professional problems [Abramova et al., 2021]. The post-graduates with modern competencies will occupy a key position in the labor market, since it is on them that the innovative development of companies and the level of competitiveness of countries in the world market ultimately depend [Abuzyarova et al., 2021].

Research materials and methods

The study involved 105 undergraduate students (third-year students, Economics and Management Department) from a public management-oriented university in Russia. The study used two stages. The first stage explores students' awareness and readiness for using digital skills and competencies for the digital economy and the foreign language business activity. It involved some statements related to the digital competencies that could be essential to participate effectively in the digital economy. We developed the statements that required undergraduates in Economics and Management to demonstrate that they could have a basic understanding on digital skills, digital environments and their current digital skills needs in the foreign language business activity:
• I know what makes digital skills valuable;
• I know how to be digitally competent in the foreign language business activity;
• I know why companies need employees with digital skills;
• I know what digital skills are essential for companies and increasingly important for my future career;
• I am interested in furthering my knowledge and training, especially in digital skills;
• it is easy for me to interact through various digital technologies;
• I find it easy to understand the relevant digital communication means for the particular context in the foreign language business activity;
• I am confident about collaboration and networking via digital media as well as managing my own digital identity;
• I am able to use collaboration and communication tools in the foreign language business activity;
• I am able to analyse, evaluate, understand, and reflect on information and digital media in the foreign language business activity;
• I tend to have no problems identifying and assessing my own skill gaps;
• I am able to find and close digital skill gaps;
• I am able to set education and training goals;

_____

[4] The Ministry of Digital Development, Communications and Mass Media of the Russian Federation, *Digital educational platform*, available at: https://digital.gov.ru/ru/activity/directions/934/ (accessed 30.06.2022).

• I am confident developing and refining digital competencies;
• I am able to make the right decisions, and select the right solutions and means for developing new competencies;
• I am able to design new ways to solve the tasks in digital environments;
• I am able to innovate processes and ways of solving problems and problem situations;
• It is easy for me to articulate information needs in the foreign language business activity;
• I am confident in searching for and accessing data, information and content in digital environments, and navigating between them;
• I know how to use strategies when searching for information in the foreign language business activity;
• I find it easy to build and update personal search strategies;
• I am confident finding, filtering, evaluating, and managing data and digital content in the foreign language business activity.

These statements aimed to evaluate awareness of the digital skills value and the importance for the business career, ways of becoming digitally competent in the foreign language business activity, interests in furthering education and training, especially in digital skills, along with the ability to interact, be confident and be able to perform routine tasks at the workplace. The students' answers were evaluated according to the following criteria: agreement or disagreement. The students were welcomed to provide "true of me" or "not true of me" for their answers.

The second stage was based on the results obtained from the first stage. It allowed assessing students' awareness and readiness for using digital skills and competencies for the digital economy and the foreign language business activity. The second stage was aimed to identify the student's needs and gaps in the basic digital knowledge and digital skills. The findings on general and professional educating, and generating and developing digital competencies were used to build the model of the foreign language online course.

Results

Table 1 presents the data regarding students' awareness and readiness for understanding digital skills and digital environments.

For the first statement, 68 students (64.76 %) knew what makes digital skills valuable while 37 (35.24 %) undergraduates did not confirm that they were informed. 68 students (64.76 %) seemed to know how to be digitally competent in the foreign language business activity. 37 undergraduates (35.24 %) showed the absence of such kind of knowledge. The answers of 97 students

(92.38 %) for knowing why companies needed employees with digital skills were positive. 8 respondents (7.62 %) gave negative replies. Almost all the students (98.10 %) knew what digital skills were essential for companies and increasingly important for the future career. 2 students (1.9 %) did not demonstrate their awareness of essential digital skills for the businesses and future workplace. As for the furthering knowledge and training, especially in digital skills, 102 two students (97.14 %) confirmed their interest in gaining additional knowledge and professional training. Only 3 of the respondents (2.86 %) did not feel being interested.

Table 1

Understanding the digital skills and digital environments

Statements	Number of respondents, people (%)	
	True of me	Not true of me
I know what makes digital skills valuable	68 (64.76)	37 (35.24)
I know how to be digitally competent in the foreign language business activity	68 (64.76)	37 (35.24)
I know why companies need employees with digital skills	97 (92.38)	8 (7.62)
I know what digital skills are essential for companies and increasingly important for my future career	103 (98.10)	2 (1.90)
I am interested in furthering my knowledge and training, especially in digital skills	102 (97.14)	3 (2.86)

Compiled by the authors on the materials of the study

Table 2 shows the students' understanding of basic digital skills and competencies for digital economy: communication and collaboration; self-development in conditions of uncertainty; creative thinking; information and data literacy.

All students (100 %) agreed that it was easy to interact through various digital technologies. The majority of the respondents, 92 (87.62 %), found it easy to understand the relevant digital communication means for a particular context in the foreign language business activity. 13 students (12.38 %) reported being hard to do. 89 undergraduate students (84.76 %) were confident about collaboration and networking via digital media as well as managing their own digital identity. 16 others (15.24 %) were unconfident. Responding to the statement of the ability to use collaboration and communication tools in the foreign language business activity, 78 students (74.29 %) said that they were able to do. 27 undergraduates (25.71 %) did not agree with the statement. 80 respondents (76.19 %) showed the ability to analyse, evaluate, understand, and reflect on information and digital media in the foreign language business activity. 25 students (23.81 %) did not demonstrate their competence in the activity.

The students' answers, 72 (68.57 %), confirmed the tendency to have no problems identifying and assessing their own skill gaps. 33 undergraduates (31.43 %) had difficulties to deal with their own skills. Most of the students, 74 (70.48 %), answered that they were able to find and close digital skill gaps. 31 respondents (29.52 %) did not mentioned about such a type of ability. 83 undergraduates (79.05 %) stated that they were able to set education and training goals. 22 students (20.95 %) did not provide affirmative answers. 85 undergraduate students (80.95 %) were confident developing and refining digital competencies. 20 respondents (19.05 %) opposed. The undergraduate students, 88 (83.81 %), were able to make the right decisions, and select the right solutions and means for developing new competencies. 17 undergraduates (16.19 %) were not able to consider proper decisions and solutions.

69 respondents (65.71 %) were convinced of their ability to design new ways to solve the tasks in digital environments. 36 (34.29 %) gave the opposite answers. 81 students (77.14 %) were sure that they had ability to innovate processes and ways of solving problems and problem situations. 24 undergraduates (22.86 %) did not agree with the statement.

71 students (67.62 %) confirmed that it was easy for them to articulate information needs in a foreign language. 34 respondents (32.38 %) said that it was hard to do. 73 undergraduates (69.52 %) were positively correlated with their confidence and performance in searching for and accessing data, information and content in digital environments, and navigating between them. 32 respondents (64.76 %) opposed. 70 undergraduate students (66.67 %) knew how to use strategies when searching for information in the foreign language business activity. 35 young people (33.33 %) were not informed. 69 respondents (65.71 %) found it easy to build and update personal search strategies. The others (34.29 %) felt opposite. 74 students (70.48 %) were confident finding, filtering, evaluating, and managing data and digital content in the foreign language business activity. 31 undergraduates (29.52 %) were not sure.

Table 2

Understanding the current digital skills needs and gaps

Basic digital skills and competencies for digital economy and foreign language business activity	Number of respondents, people (%)	
	True of me	Not true of me
Communication and collaboration		
It is easy for me to interact through various digital technologies	105 (100.0)	0 (0)
I find it easy to understand the relevant digital communication means for a given context in the foreign language business activity	92 (87.62)	13 (12.38)
I am confident about collaboration and networking via digital media as well as managing my own digital identity	89 (84.76)	16 (15.24)
I am able to use collaboration and communication tools in the foreign language business activity	78 (74.29)	27 (25.71)
I am able to analyse, evaluate, understand, and reflect on information and digital media in the foreign language business activity	80 (76.19)	25 (23.81)
Self-development in conditions of uncertainty		
I tend to have no problems identifying and assessing my own skill gaps	72 (68.57)	33 (31.43)
I am able to find and close digital skill gaps	74 (70.48)	31 (29.52)
I am able to set education and training goals	83 (79.05)	22 (20.95)
I am confident developing and refining digital competencies	85 (80.95)	20 (19.05)
I am able to make the right decisions, and select the right solutions and means for developing new competencies	88 (83.81)	17 (16.19)
Creative thinking		
I am able to design new ways to solve the tasks in digital environments	69 (65.71)	36 (34.29)
I am able to innovate processes and ways of solving problems and problem situations	81 (77.14)	24 (22.86)
Information and data literacy		
It is easy for me to articulate information needs in the foreign language business activity	71 (67.62)	34 (32.38)
I am confident searching for and accessing data, information and content in digital environments, and navigating between them	73 (69.52)	32 (64.76)
I know how to use strategies when searching for information in the foreign language business activity	70 (66.67)	35 (33.33)
I find it easy to build and update personal search strategies	69 (65.71)	36 (34.29)
I am confident finding, filtering, evaluating, and managing data and digital content in the foreign language business activity	74 (70.48)	31 (29.52)

Compiled by the authors on the materials of the study

Discussion

The survey showed that more than half of the undergraduate students (64.76 %) knew what makes digital skills valuable and how to be digitally competent in the foreign language business activity. Most of the undergraduates (92.38 % and 98.10 %) were informed of why businesses need employees with digital skills and what digital skills could be essential for companies and their future career. The majority (97.14 %), as can be seen from the responses to the statement about furthering their knowledge and training, especially in digital skills, were interested in.

The findings demonstrated that all undergraduate students (100 %) were able to interact through digital technologies. The majority of respondents (87.62 % and 84.76 %) were confident about the relevant digital communication means and collaboration, and networking via digital media. Most of the undergraduates (74.29 % and 76.19 %) were able to use collaboration and communication tools, and to analyse, evaluate, understand, and reflect on information and digital media in the foreign language business activity.

The results revealed a positive association with the tendency to have no problems identifying and assessing the skill gaps. Most of the undergraduate students (70.48 % and 79.05 %) were able to find and close digital skill gaps, and to set education and training goals. 80.95 % and 83.81 % of the students were sure about their confidence to develop and refine digital competencies; and to make the right decisions, and select the right solutions and means for developing new competencies.

The current study showed that most of the undergraduates (65.71 % and 77.14 %) were able to design new ways to solve the tasks in digital environments and to innovate processes and ways of solving problems.

The results of the study showed that more than half of the undergraduates confirmed their ability to be involved in the foreign language business activity: to articulate information needs; to search for and access data, information and content in digital environments; to use strategies when searching for information; to build and update personal search strategies; to find, filter, evaluate, and manage data and digital content.

Based on the findings that confirmed the importance of digital skills and increasing importance of being required in the digital economy, we designed the model of the foreign language online course. The online course provided a good foundation for advanced and independent study through training and developing the basic digital competencies. The foreign language online course with essential knowledge and skills practices could support further lifelong learning and business career moving.

The course themes are offered to ensure development of the ability to analyse real-life business problems and develop effective solutions to them, gain and reinforce a range of conceptual, digital and personal skills.

Conclusion

In the last ten years in Russia, one can observe the intensive development of technological resources of the information educational environment, their active development and pedagogical understanding [Rybakova, 2021]. The integration of digital tools in education has led to the emergence of new types and forms of the educational process, allowing acquiring interdisciplinary skills in a short time that serve as the basis for future metaprofessional qualities [Zeer et al., 2020].

For the transition of society to the digital age, it is necessary to make changes in the educational environment aimed at training new specialists with digital competencies. Changes should occur in technologies and training programs, methods and means, forms of educational activities, planned educational results, assessment results. At the same time, an integrated approach to education is important, implemented not only through the content of various disciplines united by a common goal, but also including the most modern technologies, methods, means of activating the learning process.

In the course of digital transformation, graduates of higher educational institutions should come to the construction of their own information space, which will ensure the continuity of education and will contribute to the formation of such competencies of the undergraduates as communication and collaboration, self-development in conditions of uncertainty, creative thinking, information and data literacy.

The paper showed that undergraduate students consider the active introduction of digital transformation into the educational process a necessary component for acquiring modern digital competencies, which necessitates further development of the key skills of future specialists to work in a digital environment, including a foreign language. It should be noted that the acquisition of digital skills and competencies leads to the development of the ability to creative non-standard solutions, as well as the development of communication skills. The development of creativity, critical thinking, communication skills is closely related to the introduction of digitalisation in the learning process.

References

Abramova I.E., Shishmolina E.P., Nikolaeva O.O. (2021), "Professionally integrated foreign language training for hospitality students in the context of digitalization", *Perspectives of Science and Education*, no. 52(4), pp. 238−246.

Abuzyarova D., Belousova V., Krayushkina Zh., Lonshcikova Yu., Nikiforova E., Chichkanov N. (2021), "The role of human capital in science, technology and innovation", *Foresight*, vol. 13, no. 2, pp. 107−119, https://doi.org/10.17323/2500-2597.2019.2.107.119

Aksenov S.L., Arifulina R.U., Katushenko O.A., Sergeeva T.N., Romanovskaya L.V. *(*2021), "Digital transformation of the educational space: new tools and technological solutions", *Perspectives of science and education*, no. 1(49), pp. 24−43, https://doi.org/10.32744/pse.2021.1.2

Andryukhina L.M., Sadovnikova N.O., Utkina S.N., Mirzaahmedov A.M. (2020), "Digitalisation of professional education: Prospects and invisible barriers", *The Education and Science Journal*, no. 3(22), pp. 116−147, https://doi.org/10.17853/1994-5639-2020-3-116-147

Basharina O.V. (2020), "Formation of the basis of digital security as a component of digital competence", *Innovative development of vocational education*, no. 2(26), pp. 31−36.

Bolgova V.V., Garanin M.A., Krasnova E.A., Khristoforova L.V. (2021), "Post-pandemic education: falling or preparing for a jump?", *Higher Education in Russia*, vol. 30, no. 7, pp. 9−30, https://doi.org/10.31992/0869-3617-2021-30-7-9-30

Brodovskaya E.V., Dombrovskaya A.Yu., Petrova T.E., Pyrma R.V., Azarov A.A. (2020), "Digital space of leading universities: the comparative analysis of sites", *Higher Education in Russia*, vol. 28, no. 12, pp. 9−22, https://doi.org/10.31992/0869-3617-2019-28-12-9-22

Dolgikh E.A., Pershina T.A. (2019), "Statistical study of students' digital competencies", *E-Management*, vol. 2(3), pp. 64−72, https://doi.org/10.26425/2658-3445-2019-3-64-72

Rybakova M.V. (2021), "Digital educational environment as a factor of foreign language competences development", *Perspectives of Science and Education*, no. 49(1), pp. 232−248, https://doi.org/10.32744/pse.2021.1.16

Zeer E.F., Symanyuk E.E., Lebedeva E.V. (2021), "Transprofessionalism as a predictor for the preadaptation of an agent to the professional future", *Siberian journal of psychology,* no. 79, pp. 89−107.

Zeer E.F., Tretyakova V.S., Zinnatova M.V. (2020), "Innovative model of socio-professional development of a student's personality", *The Education and Science Journal,* no. 3(22), pp. 83−115, https://doi.org/10.17853/1994-5639-2020-3-83-115