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**Global Challenges and Prospects of the Modern Economic
Development**

**UPDATING THE SOCIO-PROFESSIONAL COMPETENCE OF
THE DIGITAL ECONOMY SPECIALIST**

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Abstract

The article considers the problem of professional training of digital economy specialists in the focus of a competent approach, which is fundamentally developed in domestic pedagogical science but has not lost its significance for the period of digital transformation. Based on the methodology of the post-classical paradigm of technoscience, the article justifies the request of the economy to form digital competencies for the conditions of digital transition, integration and convergence of technologies, understanding knowledge as the main resource of digital technologies, the variety of interactions and the speed of updating information. The article presents a comparative analysis of international projects for the development of digital competencies in Argentina, Poland, Russia and the Joint Research Center (JRC) of the European Union. The authors point to a steady tendency to view digital competencies in a wide context, not limited to the field of computer science, mathematics and technology, but interpreting them as end-to-end "transversal means" "intellectual imbibitions," which permeate all aspects of human life. At the same time, the article notes options for testing this approach in domestic practice of training engineering personnel. The authors explain the socio-professional orientation of the specialist's competence as a consequence of this trend and the increase in values and ethical standards by diversity, speed and safety of information movement. In Russian practice, the model of a new generation specialist integrates blocks of personal, social and professional development.

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1. Introduction

The Passport of the national program “Digital Economy of the Russian Federation” (2018) contains the wording of the strategic goal of training highly qualified digital economy specialists by competent personnel. Section 4.3 of this Federal Project formulates guidelines for achieving a strategic goal in the focus of developing the concept of the basic model of competencies of the digital economy, including a list of key competencies and the mechanism for updating them, models of personal profiles of competencies and services of their development trajectories. Every specialist who wants to be successful in an organization must have special “digital” knowledge: this view brings together researchers of different directions and profiles (Sheremetyeva et al., 2020). Thus, the competent approach, fundamentally developed in domestic pedagogy, has not lost its significance in the present. At the same time, the parameters of the fourth industrial revolution indicate the expediency of updating the concept of professional competence with the realities of digital transition. Digitalization in Russia of the 21st century, according to Russian economists, is manifested by the flourishing of digital technologies, based on information revolution and economic globalization (Gretchenko et al., 2018). This methodological perspective opens up an opportunity for scientific understanding of the structure and content of competencies of a specialist in the digital economy. The boundaries of scientific search are determined by the processes of modernization of professional education. They imply the continuous renewal of professional knowledge, skills by "all willing working citizens", including the acquisition of competencies in the field of the digital economy. Thus, the problems of developing professional competence of a specialist are relevant, both from the academic and applied sides, as an important factor in the digital transformation of Russian enterprises.

2. Problem Statement

The emergence of the digital economy relies on a new understanding of knowledge in the context of the post-classical paradigm of science as technoscience. In conditions of self-development of multidimensional structures, integration and convergence of technologies, non-linear development trajectories knowledge is becoming a paramount resource of innovation economies. The efficient management of generation, use, accumulation and transfer of knowledge within a non-linear innovation process plays a critical role in economic growth (Mikhaylov et al., 2020). Therefore, digital transformation is accompanied by a "breakthrough" movement towards new forms of organization of knowledge, transformation of information into knowledge, which allows us to formulate a set of problems in the development of competencies of a specialist in the digital economy. Researchers note that the functioning of technological means, even with the highest automation and telecommunication of production, is mediated by human activities. Network communication imposes increased requirements for social literacy of specialists, skills and skills to interact, engage, convince in conditions of multiple interactions, remote access and high speed of communications. Together, the social and intellectual context of the "digit" and the emergence of the world of "algorithmic deism" objectify the tasks of instrumental design of the professional competence of the digital economy specialist, in the light of new realities, when a person and

a computer act as alternative platforms for realizing “abilities” or “functions”, "independent of material differences between platforms" (Fuller, 2019, p. 21).

3. Research Questions

The influence of digital technologies on the development of society, production and man is diverse. That is reflected in numerous publications of domestic and foreign authors. Researchers from different scientific fields and from different sides justify the increasing importance of professional competencies in the staffing of the digital economy. The authors point to the employers' request: “Because of the transition to the digital economy, technologies development and change in economy’s tendencies, employers have started to create new requirements for professionals to enter their companies”, ... “that reflects transition from traditional base competencies to digital under the influence of digitalization” (Frolova & Borisova, 2020, p. 928). Understanding preparedness in an innovative digital environment requires clarifying a number of research issues as an important part of professional training in the digital age.

1. What features of digital competency development does international education practice reflect?
2. What social aspects, value targets and ethical aspects of digital environment interactions are significant for the digital economy specialist?
3. To what extent is the demand for the formation of social and professional competence of a specialist relevant for the digital economy?

4. Purpose of the Study

The systematization of a variety of empirical material reflecting digitalization processes in various sectors of the Russian economy on the problem of training competent specialists in the digital economy made it possible to formulate the goal of scientific research - to justify the formation and strengthening of the social component in the structure of professional competencies of the digital economy specialist based on a comparison of approaches of domestic and foreign practice. The broad scale of the goal corresponds to a list of priority areas for updating skills and acquiring competence by citizens of the Ministry of Education and Science of the Russian Federation. The order indicates "the development of the digital economy, including information and telecommunication infrastructure, high-speed transmission, processing and storage of large amounts of data, information security, digital technologies and platform solutions" and identifies key areas of socio-economic development (On determining the list of priority areas for updating skills and acquiring competencies by citizens, taking into account regional and sectoral needs for 2019 (approved by the Order of the Ministry of Education and Science of Russia dated March 29, 2019, No.178)).

The advancement of the goal is determined by the nature of the network space of the digital environment, the features of which objectively, regardless of industry affiliation, predefine attention to social, behavioral, and personal factors. These are the characteristics: “stable cooperative and informational links of economic agents; mutual coordination as the leading way of coordinating interaction; gradual replacement of bargaining transactions by rationing transactions; building a hierarchy of interaction fields, including markets and value networks” (Ustyuzhanina et al., 2018, p. 77). It must also be understood that

this technological revolution has a huge impact on our cognitive skills and our ability to organize and develop knowledge (Schneider, 2012). “The founders of the digital economy and the creators of innovations must be ready to predict all possible effects and consequences (both positive and negative) of their development” (Guryanova et al., 2020, p. 661).

5. Research Methods

The methodology of the post-nonclassical paradigm of technoscience has approved a trans-disciplinary approach in research practice, taking into account the variety of proposals and scientific views on understanding and forming the competencies of the digital economy specialist and eliminating the contradictions of a single unified category definition. The theory and practice of digital transformation goes beyond the simple technical and technological rearmament of the Russian economy. Therefore, the study overcomes the framework of a technical and technological perspective in understanding the professional competence of a digital specialist, and involves the formation of theoretical models and practical techniques for the professional development of a specialist based on his personal potential, self-realization and life well-being in a modern digital society. The methodology of interdisciplinary interaction helps to identify the potential of a specialist for innovative actions and solutions, which is relevant for the digital economy.

Based on the stated methodology, the following research methods were used: review of scientific literature, streamlining and systematization of discussion materials on professional competencies in the context of the emerging digital culture practice, logical analysis of the problems of increasing rationalization, division of labor and specializations in the digital economy or integration and synergy of professional functions and the emergence of new types of professional activities. A comparative analysis of the practice of professional activity in various areas of production has shown the strengthening of the function of specialist personal responsibility in a distributed environment of activity, which caused a change in the ethical attitudes of subjects of performing functions and making decisions, strengthening a sense of solidarity, belonging to a certain company and involvement in its achievements with a high individualization of labor. Design developments of San Juan National University’s Faculty of Engineering (Argentina) (Graffigna et al., 2020), Centrum CyfroweProjekt, Warszawa (Poland) (Jasiewicz, 2015), The Project of the Digital Competence of EU (Vuorikari et al., 2016) were used for analysis. The empirical material (observations, expert assessments, questionnaires, surveys) has been formed over several years of researching innovative directions for training “new generation” engineering personnel with professional skills of innovative economy on the basis of the Bauman Moscow State Technical University. Due to the emergence of new professions, roles, statuses, professional groups with the spread of digital technologies in production, there arose an objective need to study the social component of professional competencies in engineering education. This is manifested in the growth of intellectualization of labor, the development of cognitive abilities, heuristic skills, communicative skills and behavioral experience in the focus of alternative approaches in choosing promising educational technologies in connection with the intensive implementation of information resources and electronic media technologies into professional education.

6. Findings

Changing the content of professional activity in the logic of digital transition, requests from employers, provisions of the professional qualifications standard have drawn up a modern request for professional education to understand digital competencies. The spread of a competent approach is a consequence of a new economy and a "new approach to human resources" and reflects the ability of a person to adapt to life realities.

World pedagogical practice also shows that the dissemination of a competent approach derives from employers' requests for young specialists training and is widely discussed, and the concept of competence is one of the central definitions in the development of modern programs. Analysis of curriculum processes for the development of competencies in engineering education at the San Juan National University's Faculty of Engineering (Argentina) is based on "linking academic life with the social context and workplace" (Graffigna et al., 2020, p. 28). In Poland in accordance of Centrum CyfroweProjekt "the development of digital competences is important not only in a continuous perspective of the development of new technologies, but also for the possibility of their use in various areas of life" (Jasiewicz, 2015, p. 2). The frameworks of these digital competences divided into:- five general areas: information, communication, creation of content, safety, problem solving; - twenty-one competences distinguished in these areas, which are subject to evaluation on three levels: basic – average – advanced.

Comparative analysis shows that in the world pedagogical practice, the development of competencies is structured according to different levels: key skills, core skills, base skills. Key competencies perform three functions. First, they help students to learn; second, they allow employees to become more flexible, meeting employers' requests, third, they allow people to be more successful in later life. For example, "In the world of university education, competencies may be either general or specific. The development of both (general and specific) can be carried out in the context of curricular activities or in the workplace, in extracurricular activities or as citizen action" (Argentina). In order to research of Saint-Petersburg State University (SPSU) teacher, Edinova (2020), what Tuning Academy calls "generic competences" are the competences that are useful in all disciplinary areas. These are often called "transversal skills" or, in the case of Saint-Petersburg State University (SPSU), "general competences". Because of this, these competences are an influence on the development of such skills as: analytical thinking (GC-1), communication skills and writing skills (GC-2), and organizational skills (GC-3). In the theory of professional education in Russia, three types of competencies are also distinguished: key, basic and special. The requirements for the results of mastering the Federal State Educational Standard 3 ++ included them in the form: universal and professional. However, digital competencies, like cross-cutting universality for all types of activities, have not become apparent, as in the practice of the EU countries. The educational, sociocultural, information environment of the Bauman Moscow Technical University creates conditions for the formation of professional competencies in the light of the development of professionally important personality qualities of new generation engineers in accordance with the requirements of priority areas of knowledge-intensive industries in the direction of cross-cutting universals research, which is studied in the process of experimental work of teachers. This is confirmed by an experimental study led by Professor Khoroshavina in the implementation of the innovative educational project "Technopark" (Khoroshavina et al., 2016), developed by the Bauman Moscow State Technical University and Mail.RuGroup corporations,

where effective teaching practices provide promising engineering training for students and a sample of the social aspect is shown in Table 1. During the experiment, such parameters as freedom of choice of learning trajectory; professional interests of the individual; cultural values; creative initiative; self-development; creativity are considered. The measurement data in the Table 1 show the positive dynamics of engineering training, the inclusion of cross-cutting parameters in the formation of socio-professional competencies of specialists.

Table 1. Results of social integration experiment in engineering training (project "Technopark")

Groups	Results from total% of respondents	Creative approach to projects and innovations	Continuity of self-development	Research activity	Productivity
Control	33	27	17	32	9
Experimental	78	77	58	78	77

Source: authors.

The general trend of international practice should recognize the special importance of the social component in the structure of professional competencies. Ten general competencies are proposed, divided into two subgroups, by San Juan National University: "The first is the set of technological general competencies, while the second includes the social, political and attitudinal general competencies" (Argentina). Russian teachers also characterize social competencies as "indispensable component of professional competence": "Modern society demands from the system of education a holistic, variably thinking, and creative personality, capable of managing innovation, ready to make their own decisions and take responsibility for them, who has extensive communicative skills" (Kazakov et al., 2017, p. 291). In the course of studying open publications with materials for the development of competencies by educational organizations, a comparative analysis of projects was carried out, the results of which were formatted in the form of Table 2. This table reveals general and special trends in the understanding of competencies and shows a movement towards understanding digital competencies in the area of the European Union countries as cross-cutting "transversal" units that cover all aspects of human life, including its professional activity. At the same time, this approach to consider digital competencies as "blended means," "intellectual imbibitions" is also tested in domestic practice of engineering personnel training.

Table 2. Comparative analysis of projects for the development of digital competencies (author's version)

The San Juan National University's Faculty of Engineering (Argentina)	The Bauman Moscow State Technical University Project "Technopark"	The Joint Research Centre (JRC) the Digital Competence Framework 2.0	Centrum Cyfrowe Projekt, Warszawa
Technological and social competencies	Competencies Professional-Instrumental	A list of 21 competencies that the European Commission determined for Europe citizens	The DIGCOMP model based on IT and information competences
Identify, formulate and resolve engineering problems	Active cognitive position and intellectual activity in solving engineering issues	Information and data literacy: browsing, searching and filtering data, information and digital content; evaluating data,	Work and professional development (Functional competences: work more effectively, comfortably,

Ideate, design and develop engineering projects	Creative approach to project design and innovation	information and digital content; managing data Creatively using digital technologies; Identifying digital competence gaps	faster; take care of my career find a job) Relationship with relatives (Functional competences: perform parental duties; maintain the social relations; protect privacy; image)
Arrange, plan, execute and control engineering projects	The productive nature of the activity with bringing the engineering solution to the state of the final product	Communication and collaboration: interacting, sharing, engaging in citizenship through digital technologies	Education (Functional competences: gain new qualifications; learn via Internet; create educational resources and share resources with others)
Effectively utilize application techniques and tools in engineering	Competency Workbench	To use digital tools and technologies for collaborative processes, and for co-construction and co-creation of resources and knowledge	Working on interests /Leisure and hobby (Functional competences: fill free time with content; develop my hobby; protect my personal development)
Contribute to the generation of technological developments and technological innovations	Research activity in project development, finding original solutions to engineering problems	Safety: Protecting devices; Protecting personal data and privacy; Protecting health and well-being; Protecting the environment	Health (Functional competences: have a healthy lifestyle; use the health care system; obtain information and health self-care; take care of health of people)
Perform effectively as part of a team and communicate effectively	Business communication, tolerance, organizational behavior, cross-cultural skills	Collaborating through digital technologies; transmitted over the internet, or other digital means, e.g. mobile phone network	Everyday issues (Functional competences: handle the official matters without leaving the house; do online shopping, plan, etc.)
Act ethically, with professional responsibility and social commitment	Active citizenship, compliance with social norms and rules	Digital content creation: Developing digital content; Integrating and re-elaborating digital content; Copyright and licenses; Programming	Religion and spiritual needs (Functional competences: satisfy spiritual/religious needs; participate in the civil life, in political life)
Learn continuously and autonomously; increase professional qualifications	Education, development and professional development throughout life	Problem solving: Solving technical problems; Identifying needs and technological responses	Finance (Functional competences: manage my finances; buy cheaper; earn online)
Act with entrepreneurial spirit	Realization of professional potential and mobility of a specialist	Managing digital identity; To create and manage one or multiple digital identities, to be able to protect one's own reputation	Establish and conduct a business (Functional competence: gain knowledge about the commune, the country and the world)

Source: authors.

7. Conclusion

A comparative analysis of the international practice of developing professional competencies in the digital economy has shown a steady tendency to consider digital competencies in a broader context, not limited to the field of computer science, mathematics and technology. Digital competencies as stated in Tuning project (Spain & Netherlands) - "the proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development." Therefore, they permeate all aspects of human activity living in the realities of the digital environment, and are variously functionally manifested. This tendency of a cross-cutting "trasversal" approach is especially evident in the countries of the European Union and corresponds to the growth of cognitive interest and personal development in the profession, preventing a rapid "half-life of competence" of a specialist. The consequence of this trend should be recognized as the increase in social significance, values and ethical standards in the space of a variety of virtual interactions, high speed of information movement and security. The study has shown that despite the active impact of digitalization, the value of human and electronic potential does not decrease, but, on the contrary, is updated. In Russian practice, the model of a new generation specialist integrates blocks: personal, social, professional. And the wide context of digital competencies is met by the development of Russian teachers on the signs of key competencies that fully meet the conditions of transversality. This is an integral, polyfunctional, over/inter-dimensional, multidimensional character. The instrumental criteria for the rapid processing of information (intellectual activity), adaptation to changes, rational organization in a multidimensional digital environment, and socialization of digital interaction become significant signs of the qualifications (competence) of a digital specialist.

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