Digital Competencies for the Development of the University's Human Capital

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***Abstract*—The era of digitalization dictates qualitative changes in the professional activities of university teaching staff. New technologies require the development of digital competencies. The main trajectories and trends of competence transformation in the 21st century are considered. Fundamental changes in the educational process based on new technologies are highlighted. The scientific views on the formation of the human capital of an educational organization are investigated. The components of digital competencies for the development of the university's human capital are noted. The characteristics of pedagogical digital competence are given.**

***Keywords*—Education, digital competencies, basic competencies, university, technological development, human capital.**

I. Introduction

The quality of professional activity of university teaching staff determines the success of the educational process and the training of personnel for all areas that determine the effective functioning of society and the state as a whole.

The era of digitalization is characterized for education by a change in human development models, transformations of the processes of creation, preservation and translation of knowledge, changes in the processes of evaluation and fixation of achievements, transformation of organizational management of educational organizations. The teaching staff of the university is faced with the task of creating new educational environments and spaces that form a qualitatively "complex" person for a "complex" world, which is one of the strategic priorities of education. The accelerating technological development requires fundamental changes in the formats of training future professionals.

II. Problem Statement

The global digitalization of the economy causes qualitative changes in the professional activities of university teaching staff.

Global Education Futures experts note the main trajectories of competence transformation in the 21st century [1]:

- technological: digitization of all spheres of education, business and life, transformation of the model of human development and human labor in the processes of creation, preservation and translation of knowledge, changes in the processes of evaluation and fixation of achievements, transformation of organizational management of educational organizations;
- social: urbanization, the leading role of women in the economy and business professions, the growth of life expectancy, the development of network technologies;
- techno-social: economic, technological and cultural globalization, the strengthening of the role of transnational cooperation, the widespread importance of environmental business;
- meta–trend - the speed of change: the pace of change and renewal of the surrounding world is increasing, including global changes in educational processes.

New spheres of activity are emerging, focused on the realization of a person's creative potential. These areas require skills that were not needed when performing routine physical or intellectual tasks: creative economy, environmental sphere, cybereconomics, human-oriented services, new technology sector.

In the 21st century, the university's higher education system does not fully meet the requirements and demands of the labor market. The functionality of professions is being rapidly updated, and as a result, the management of universities should be ready to create relevant training programs for new specialties that are in demand in the future, and flexibly adapt existing training areas to the needs of business and the market.

The Atlas of New Professions notes the following trends in the change of competencies of the 21st century [2]:

- social processes: global globalization, changing consumer preferences, changes in business management models, environmental friendliness);
- technological processes: the spread of information and communication technologies, the emergence of new technologies;

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- changes in management practices, production, workplaces, industries.

Growing changes require new "supra-professional" skills for specialists of educational organizations.

The basic competencies of the 21st century include:

- working with people;
- project management;
- digital literacy;
- cross-cultural;
- systems thinking;
- concentration and attention management;
- emotional literacy;
- creativity;
- environmental thinking;
- working under conditions of uncertainty;
- learning ability and self-learning;
- robotics;
- programming.

In the era of digitalization, the teaching staff of the university is faced with the task of creating new educational environments and spaces that form a qualitatively "complex" person for a "complex" world, which is one of the strategic priorities of education.

The accelerating technological development requires fundamental changes in the formats of training future professionals. On the one hand, it is the maximum flexibility of the content and forms of training, the development of supra-professional competencies and, on the other hand, the need for ultra-fast training and point, narrow competencies that are in demand today in the labor market. Universities train future personnel in conditions of exponential growth and rapid "decay" of knowledge; the need for a new realization of values based on new technologies; the increasing dynamism and lability of the labor market, which necessitate cyclical education throughout life [3].

Knowledge, education, practical skills, creative and intellectual abilities of teaching staff, as well as their personal qualities realized in professional activities are important [4].

Education should be transformed into a coherent ecosystem in which diverse educational elements will coexist.

III. Research Questions

In this study, the human capital of the university is considered in the context of the influence of higher education on the formation of the human capital of graduates of higher education in the country through the formation of the necessary competencies and knowledge for production and society. It is the human capital of the university's scientific and pedagogical staff that determines the success of training competitive personnel for the digital economy, the formation of a person's readiness for professional activity in a complex society of strategic uncertainty.

The formation and development of digital competencies of the university's human capital is one of the most important organizational and pedagogical tasks and actualizes the search for effective strategies and mechanisms for its development that meet modern challenges.

The education provided by the university is becoming increasingly digital. Digital competencies include the ability to independently use modern information and communication technologies in teaching activities to solve a wide range of educational questions [5]

In most countries of the world, digital educational resources are used in education, for example, MOOC (Massive open online course). Thus, most educational institutions in Sweden have implemented such courses, and most of the teaching is conducted online, while the number of students in online courses is constantly growing [6]. There are differences between student groups, for example, instead of enrolling in the entire program online, students can choose independent courses, both with the aim of obtaining a deeper development of a certain competence or obtaining additional professional education while maintaining their current job. Thus, digitalization entails new questions and challenges for university teachers to ensure high-quality education. At the same time, the key task of all educational systems is to train people with a wide range of skills and competencies.

An important contribution in the field of digital competence was made by R.J. Krumsvik, who is currently engaged in "empirical testing of a theoretical model of digital competence." The concept that he develops is the status of this skill in the education system as a basic one [7]. He argues that although the term "digital literacy" is widely used internationally, the concept of "digital competence" is still the preferred term, as it has a broader and holistic meaning, where "the focus is on the teacher and the subject itself, while technical skills are only part of this complex concept of digital competence" [8]. He also believes that "digital competence is the ability of teachers to use information and communication technologies in a professional context, combined with a good pedagogical (didactic) understanding and awareness of its importance for learning strategies."

The research of the university's human capital is based on the methods, types and technologies of thinking, perception and processing of information, where the central place is occupied by a person and his development. The priority is the professional and personal development of the student, the formation of active mechanisms of cognition and self-development, which is especially important in the era of digitalization with its information saturation and multi-valued technology. The formation of the human capital of society determines the high level of a university graduate, and, in turn, it is largely created by the human capital of the university itself, its people who make up the teaching staff.

The foundations of the theory of human capital were laid in the studies of the classics of political economy. K. Marx noted that "the development of fixed capital is an indicator of the extent to which universal public knowledge has turned into a direct productive force ... and the conditions of the social life process itself are subordinated to the control of universal intelligence and transformed in accordance with it" [9]. Schultz, equating the knowledge and skills of an individual to capital, introduced the phrase "human capital" and proved that investments in education and healthcare can bring more income in the future than physical capital [10]. An important contribution to the theory of human capital was made by G. Becker, who introduced the concepts of "general human capital" (knowledge of a universal nature) and "specific human capital" having value within a specific organization or type of activity [11].

According to scientists, the components of human capital are not only knowledge, health, culture, personal freedom, but

also attribute qualities and properties, productive abilities, functional roles.

The era of digitalization actualizes the need to identify new "drivers of digital development of human capital," according to N.R. Kelchevskaya and E.V. Shirinkina. Scientists consider "the process of digital development of human capital as the integration of all participants: the labor market, industry and the education system", emphasizing the need to transform strategic human capital management in the digital economy [12]. Issues related to human capital management are also considered in relation to national research universities. A special place is occupied by research on the problems of investment in human capital as a factor of successful development of organizations and society in the era of the digital economy. Research on the formation of the human capital of scientific and pedagogical personnel makes it possible to determine the "contours of promising directions for the development of the human capital of scientific and pedagogical personnel" of higher education [13]. A special place is occupied by the issues of studying the social factors of the formation and development of human capital of modern organizations in a market economy [14].

The results of the study.

The success of the functioning of the university, its educational and scientific activities determines the personnel composition. A modern university must respond to a rapidly changing external environment that generates new challenges, which determines the requirements for teaching staff and employees of an educational organization, the level of professional skill. Human capital, being a fundamental component of the effectiveness and sustainability of the university, is its special value - teaching staff, their knowledge, education, practical skills, creative and intellectual abilities, personal values and attitudes.

The human capital of an educational organization can be defined as a set of professional-labor and social-labor characteristics of employees of an educational organization used to improve the effectiveness of educational and scientific activities of an educational organization.

The components of the human capital of an educational organization are determined based on their significance in improving the effectiveness of educational and scientific activities of the organization: professional and labor characteristics (hard skills) and social and labor characteristics of employees of an educational organization (soft skills).

Since higher school teachers make up the main "mass" of the university's human capital, we will reveal their characteristics:

- hard skills (professional and labor characteristics) are a set of knowledge, skills and ways of activity of a teacher to solve the tasks of training, education and development of students;
- soft skills (social and labor characteristics) are a set of knowledge, skills and personal characteristics of a teacher in the field of interaction between participants in educational relations.

The conditional gradation of labor characteristics into hard and soft competencies is due to their orientation (professional and social) and, at the same time, a high correlation for the successful solution of professional tasks determined, among other things, by the development strategy of an educational organization.

The human capital of the university has the following properties, namely:

- the human capital of the university is the main factor of its development;
- the human capital of the university is dynamic, capable of both accumulation and dispersion;
- the formation of human capital requires various kinds of investments from employees and the educational organization itself;
- the renewal of the university's human capital implies continuous professional development of employees;
- the dynamic nature of the university's human capital is due to the "infusion of capital" of individual employees, mainly teaching staff;
- the risk of dispersion of the university's human capital is associated with organizational management mechanisms and the potential of teaching staff;
- the renewal of the human capital of the university can be carried out at the expense of internal reserve factors of the educational organization and with the involvement of external factors – the admission of new employees in accordance with the needs of the university.

The characteristic of pedagogical digital competence is the ability to improve pedagogical work with the help of digital technology in a professional context, primarily in a web course or online training. Pedagogical digital competence includes all types of pedagogical work in a professional context where digital technologies are used.

It can be said that pedagogical digital competence develops at three structural levels:

- micro-level (level of interaction), which includes pedagogical interaction with students;
- meso-level (course level), which includes the development and implementation of courses, as well as the infrastructure of education (for example, the integration of resources such as a library or a textbook);
- macro-level (organizational level), which is focused on the management of the educational process and the development of the organization.

Thus, strategic pedagogical leadership is a central component of pedagogical digital competence at all three levels.

IV. Conclusion

The university's human capital is a fundamental component of the effectiveness and sustainability of an educational organization.

The formation and development of the university's human capital is the basis of the competitiveness of the organization of higher education and determines such priority areas of the university's activities as:

- continuous development of teaching staff and employees through the creation of a system of professional growth of a teacher;
- design and implementation of programs to support professional development and career growth of teaching staff and employees;
- making investments in human capital;
- creating a comfortable psychological climate in the organization;
- strengthening the corporate culture of the teaching staff;
- implementation of an effective personnel policy taking into account current trends.

A special role in the formation and development of the university's human capital is assigned to the development of pedagogical digital competence.

The criterion for the effectiveness of investments in human capital, which are carried out by both an employee of an educational organization and the university itself, is to increase the effectiveness of educational and scientific activities. It is possible to evaluate the effectiveness of investments in the human capital of the university only in the aspect of achieving its general goal – the formation of the readiness of the next generations for life, professional activity in the future super-complex (technological and information) society.

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