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STRUCTURAL AND FUNCTIONAL MODEL OF FORMATION OF READINESS OF FUTURE SPECIALISTS IN COMPUTER TECHNOLOGIES FOR PROFESSIONAL ACTIVITY BY MEANS OF DIGITAL TECHNOLOGIES

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Abstract

The article substantiates the structural and functional model of formation of the readiness of future specialists in computer technologies for professional activity by means of digital technologies. To achieve the goal of the article, the methodology is applied, which consists in conducting an analysis of the research of the problem of pedagogical modeling of the formation of the readiness of future specialists in computer technologies for professional activities in the field of digital technologies. On the basis of the conducted analysis, the concept of «structural-functional model», its structure and prospects of introduction into the educational process of future specialists in computer technologies are defined. It has been established that models in pedagogical science are successfully used for high-quality planning

of the educational process, management of cognitive activity of students and optimization of the structure of educational material.

In order to build a structural-functional model, its main constituent elements were determined, combined into logical blocks corresponding to the stages of the educational process (target, content, organizational, diagnostic-resultative) and complex application of modern digital technologies at all stages. The effectiveness of the implementation of the model was ensured by predefined organizational and pedagogical conditions.

Keywords: computer technologies; structural-functional model; professional education; future engineers-pedagogues; digital technologies.

Statement of the problem in a general form and its connection with important scientific or practical tasks.

The level of professional training of future vocational education specialists and their personal qualities remain priority factors for the success of education modernization and the effectiveness of using new pedagogical technologies. The Strategy for the Development of Higher Education in Ukraine for 2022-2032 envisages increasing the share and quality of innovative activities in higher education institutions. This Strategy complies with the provisions on the development of an inclusive, innovative and interconnected European Higher Education Area by 2030 in accordance with the Rome Ministerial Communiqué of November 19, 2020, and provides for overcoming challenges, in particular through digitization (digitalization) of higher education, development of virtual mobility, student-centered learning and teaching [4, p. 2].

The development of pedagogical science and the intensive introduction of digital technologies into the educational environment encourages the improvement of the content of professional training of students, methods, teaching tools and methods. The modeling method, which is widely used to explain scientific concepts in pedagogical research, is gaining multifaceted use in various fields of scientific research. Thus, solving the outlined problem requires the development of a structural and functional model of the process of forming the readiness of future specialists in computer technologies for professional activities using digital computer technologies.

Analysis of the main researches and publications on the raised problem.

The preparation of future specialists in computer technologies for professional activity can be considered as a complex and multifaceted process, which includes various aspects and stages. This approach helps ensure the growth of the quality characteristics of the training of

specialists and their readiness to perform professional tasks in the modern information society.

The study of the effectiveness of the introduction of information and communication technologies into the educational process for the training of future specialists in computer technologies in the context of the researched problem, the scientific position of M. Zhaldak that «... problems of informatization of the educational process are, first of all, a pedagogical problem» [5 with. 15].

Research by foreign scientists A. Bermus, K. Beelishe, M. Joras, M. Linard, B. Mansfield, B. Rey, L. Turkal, R. White, T. Hoffmann, E. Short, S. Shaw etc. testify that possession of digital literacy or competence implies independent, confident, critical, safe use of available technologies of technogenic information society for everyday communication, work, recreation, etc. In this direction, the education of Ukraine is at the initial stage.

We are impressed by the opinion of V. Kabak, who defined the main functions of the model as a means of scientific knowledge, to which he attributed the descriptive function (systematization of empirical data, adequacy and completeness of the description, which is a basic prerequisite for the performance of any functions), explanatory (disclosure of connections between facts or dependencies) and prognostic (prediction of new properties and relationships in the modeled object) [4, p. 64].

So, based on the analysis of scientific literature, we conclude that the model in pedagogical science is successfully used to form the readiness of future specialists in computer technologies for professional activities with the help of digital technologies.

Scientific literature confirms the successful use of pedagogical models for the formation of the readiness of future specialists in computer technologies for professional activities using digital technologies. The use of pedagogical modeling allows you to clarify the learning process, build optimal conditions for training students and ensure their success in future professional activities.

The purpose of the article is to substantiate the structural-functional model of formation of the readiness of future specialists in computer technologies for professional activity by means of digital technologies.

Presenting main material. In pedagogical research, the structural-functional model is quite popular (for example, the works of I. Hevko [1], R. Horbatyuk [2], V. Kabaka [6], Ya. Sikora [3], A. Fedorchuk [7], O. Chubrei [8], etc.), as it allows to display the structural features of the research object and study its functionality.

In order to substantiate and develop a structural-functional model of the formation of future engineers-pedagogues for professional activity by means of digital technologies, it is necessary to clarify the essence of the concept of «model» and the modeling method.

The essence of the concept of «model» is that it is an abstract representation of an object or process, which helps to understand its structure, interrelationships of components and principles of operation. A model can be presented in the form of diagrams, charts, formulas, tables, or any other symbolic means that help summarize and organize information.

Modeling is a process of creating models that allow you to investigate, predict, analyze and improve objects or processes. Modeling methods can be different and depend on the specifics of the object under study, the goals and objectives of the research.

Now that we have a clear understanding of the concepts of «model» and «modeling method», let's move on to the justification and development of a structural-functional model of the formation of future specialists of engineer-pedagogues for professional activities by means of digital technologies.

The pedagogical model allows you to imagine the educational process as a system where each element interacts with others and affects the result. It is used to analyze and optimize the content of training, methods and approaches used in the training of future specialists in computer technologies. Modeling helps to determine the key factors affecting the effectiveness of training, as well as to establish an optimal balance between theoretical and practical knowledge.

Thus, the use of pedagogical models in the preparation of future specialists in computer technologies for professional activities allows to improve the quality of education, promotes the development of competencies and practical skills of students, and also ensures their readiness for the implementation of digital technologies in professional activities. Taking into account the technological progress and changes in modern society, the use of pedagogical modeling becomes extremely relevant for the achievement of high-quality training of specialists in the field of computer technologies.

The structural-functional model is one of the approaches to system modeling. It allows you to describe the structure of the system, as well as the relationships and functions of its components. In the context of forming the readiness of future engineers-pedagogues for professional activity by means of digital technologies, the structural-functional model can be used to analyze and determine the elements and processes affecting this process.

When developing a structural-functional model of formation of future engineers-pedagogues for professional activity by means of digital technologies, the following aspects should be taken into account:

Determination of modeling goals. Clear definition of research goals and modeling of readiness of future specialists to use digital technologies in professional activities.

Selection of model components. Establishing the main elements that affect the readiness of future specialists, such as the curriculum, teachers, methodical support, educational materials, infrastructure, etc.

Definition of relationships. Establishing relationships and interactions between model components. This helps to understand how the interaction between elements affects the formation of the readiness of future specialists.

Analysis of functions. Determination of the functions of each component of the model and their contribution to the formation of the readiness of future specialists.

Use of ICT. Taking into account the use of digital technologies in the learning process and their impact on the formation of the readiness of future specialists.

Evaluation and optimization of the model. Analysis and evaluation of the effectiveness of the model, its possibility of optimization and improvement.

Such a structural-functional model will help to better understand the process of forming the readiness of future specialists of engineer-pedagogues by means of digital technologies for professional activity, to find out the main components and factors influencing this process, as well as to identify possible ways of its optimization and improvement.

At the first stage, an analysis of the system of forming the readiness of future specialists in the process of their professional training in an educational institution was carried out, the place of application was determined and the significance of digital technologies for the formation of the readiness of future specialists for professional activity was specified. At the second stage of the design, work was carried out on the transformation of the conceptual model into a structural model: the elements of the system of forming the readiness of future engineers-pedagogues for professional activities using digital technologies were determined; their hierarchical relationship is established; a set of connections between the elements of the system and the nature of their interaction is revealed.

In order to build a structural-functional model of the formation of the readiness of engineer-pedagogues for professional activities with the use of digital technologies, it was created during the design activity, which included its main constituent elements, combined into logical

blocks corresponding to the stages of the educational process. We refer to such blocks: conceptual-target, content, organizational, diagnostic-resultative (Fig. 1.).

The conceptual and objective block includes the goal that is the basis of the model developed by us – the formation of the readiness of future engineers-pedagogues for professional activities with the use of digital technologies.

The content block defines the essence of training future engineers-pedagogues for professional activity using the means of CT from the position of the three most important system characteristics – composition, structure and functions.

At this stage, in the organizational block, the organizational and pedagogical conditions of professional training of future engineer-pedagogues were defined, and scientific approaches to the formation of professional competencies were investigated. The purpose of the implementation of organizational and pedagogical conditions is to provide educational, organizational and scientific and methodological support for the formation of professional competence of future engineer-pedagogues with the application of CT and improvement of the professional training of students in higher education institutions.

The diagnostic-resultative unit combines criteria, levels of readiness of future engineer-pedagogues for professional activity, methods, forms, techniques and means of control and evaluation activities.

Thus, we have developed a structural-functional model of training future engineers-pedagogues for professional activities using digital technologies, which includes four components of readiness: motivational-targeted, cognitive-content, operational-active, and evaluation-reflective, which are located in the fourth structural block the author's structural-functional model - diagnostic-resultative.

Thus, the implementation of the goal and tasks of the study involved the creation of a structural and functional model of the formation of the readiness of future specialists in computer technologies for professional activity by means of digital technologies. This model makes it possible to systematically analyze the process of training future specialists and identify key components and relationships that influence the formation of their readiness for professional activity.

The structural-functional model helps to imagine the educational process as a system where each element performs a certain function and interacts with other elements. It allows you to understand what factors affect the success of training, what processes and resources are used to form the readiness of future specialists.

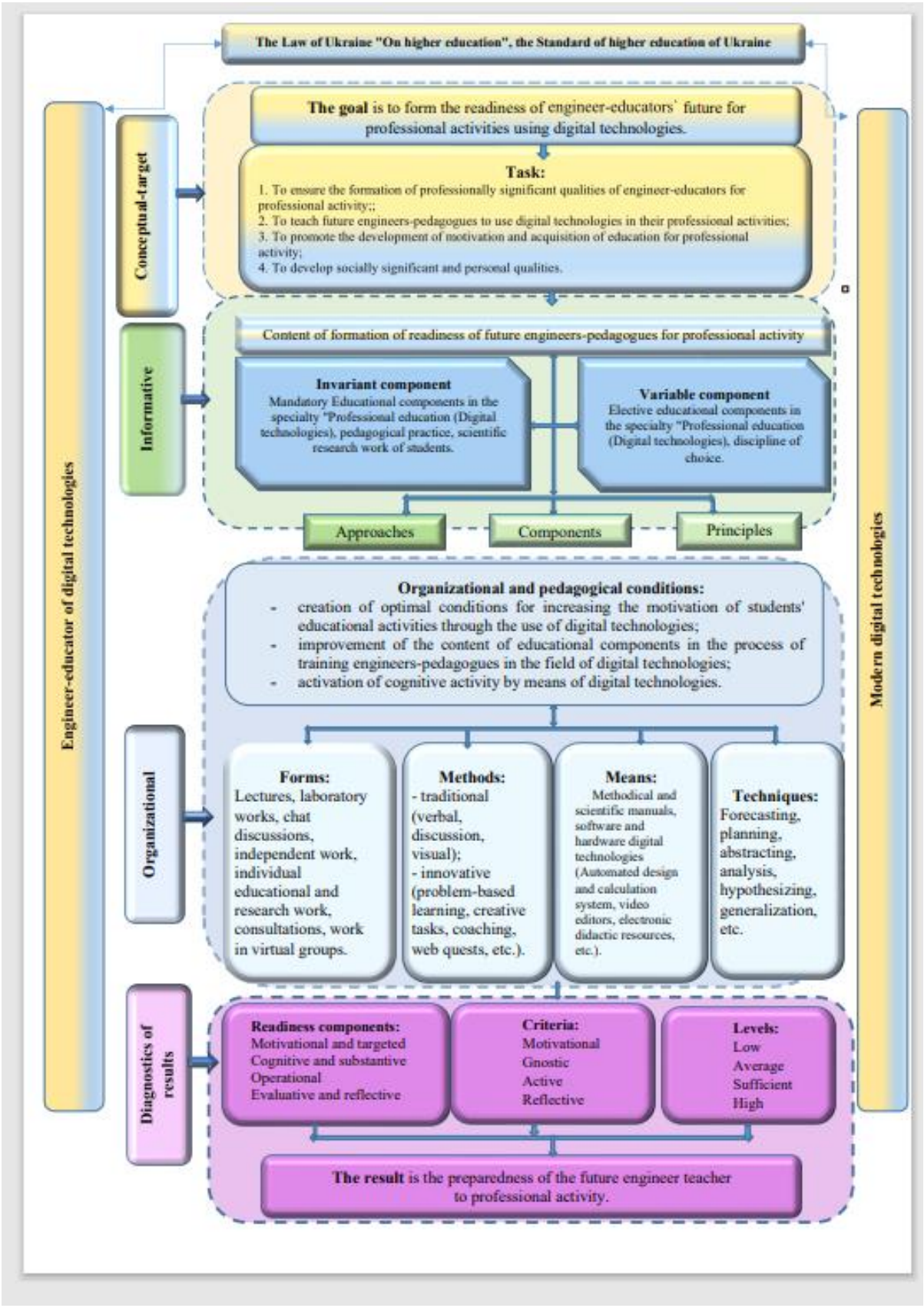

Figure 1. Structural and functional model of the formation of the readiness of engineer-pedagogues for professional activities with the use of digital technologies.

This model will be a useful tool for analyzing and optimizing pedagogical processes and achieving better results in the training of future specialists in this field.

Research conclusions and prospects for further research. The analysis of scientific and pedagogical literature really confirms that this model is an effective tool for forming the readiness of future specialists in computer technologies for professional activity. The application of the structural-functional model helps to analyze and optimize the learning process, to identify the influence of various factors and elements of the educational environment on the formation of students' readiness for professional activity.

Thus, the use of a pedagogical model in the preparation of future specialists in computer technologies for professional activity allows to improve the quality of education, promotes the development of competencies and practical skills of students, and also ensures their readiness for the implementation of digital technologies in professional activity. Taking into account the technological progress and changes in modern society, the use of pedagogical modeling becomes extremely relevant for the achievement of high-quality training of specialists in the field of computer technologies.

This structural-functional model can be used in the future to analyze and optimize the pedagogical process, as well as to predict results and improve the formation of the readiness of future computer technology specialists for professional activities.

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