ANNOTATION
dissertations for the degree «Doctor of Philosophy» (PhD) in specialty
6D075100 – «Computer Science, Computer Engineering and Control»
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DEVELOPMENT OF AN AUTOMATED SYSTEM FOR EVALUATING THE QUALITY OF SUPPORT AND ORGANIZING EDUCATIONAL PROCESS IN DISTANCE LEARNING

Relevance of the research topic. The concept of education development of the Republic of Kazakhstan for 2022-2026 sets tasks for assessing the quality of distance learning: "Work will continue on high-quality training using distance learning in organizations of technical and vocational secondary education, regardless of the forms of education and training courses. ...Thus, distance learning in Kazakhstan will receive further development and regulatory legal support as part of a possible training format with quality control of education." The issues of the quality of education, and especially the quality of the provision and organization of the educational process with distance learning technology, are becoming increasingly important not only in Kazakhstan, but also throughout the modern world, and therefore research in the field of the effectiveness of the organization of the learning process is relevant.

Another key normative document confirming the importance of the dissertation research is the Order of the Minister of Education and Science of the Republic of Kazakhstan dated March 20, 2015 No. 137, which clearly sets out the requirements for educational organizations to provide distance learning and the rules for organizing the educational process for distance learning and in the form of online training in educational programs of higher and (or) postgraduate education. One of the requirements of this order is the availability of a system for monitoring the quality of educational services in accordance with the internal quality assurance system.

In the context of modern education and approaches to assessing the quality of distance learning, a large number of different criteria for measuring it are proposed. The controversy surrounding the assessment of the quality of distance learning has created the need to develop an automated system independent of the initial set of criteria.

An automated system for assessing the quality of the provision and organization of the educational process with distance learning technology, based on the interrelationships of factors influencing the formation of the quality of education, implementing monitoring, control and analysis of the effectiveness of the organization of processes and the provision of the educational environment from the standpoint of integrity and consistency, will give the distance learning management system new opportunities to realize the educational potential of the university.

Thus, the topic of the dissertation work aimed at developing an automated system for assessing the quality of provision and organization of the educational process with distance learning technology is relevant.

The purpose of the dissertation is to develop an automated system for assessing the quality of the provision and organization of the educational process with distance learning technology, which implements monitoring, control and analysis of the effectiveness of the organization of processes and the provision of the educational environment.

To achieve the goal, the following **tasks** were set:

1. To analyze the problem of assessing the quality of the provision and organization of the educational process with distance learning technology in domestic and foreign sources in order to form the formulation of the research task.

2. To develop a model and algorithms that provide an effective solution to the problem associated with the development of an automated system for assessing the quality of provision and organization of the educational process with distance learning technology.

3. To develop and propose the necessary instrumental automation software tools that implement a model and algorithms designed to assess the quality of the provision and organization of the educational process with distance learning technology.

4. To conduct an experiment, within the framework of the proposed criteria, confirming that the developed automated system for assessing the quality of the provision and organization of the educational process with distance learning technology allows for an objective assessment of the university's distance learning system.

Object of the research is automation systems for evaluating the quality of the educational process at the university.

Subject of the research is models, methods and algorithms for building automated systems for assessing the quality of provision and organization of the educational process with distance learning technology.

Research methods: the method of analysis and synthesis, the method of theoretical and methodological analysis, cognitive modeling, expert methods, methods of management theory and decision-making.

Scientific novelty lies in a new approach to quality management of provision and organization of the educational process with distance learning technology, which is characterized by the construction of a model for an automated system for assessing the quality of provision and organization of the educational process with distance learning technology based on a criteria-based approach, expert assessment methods and hierarchy analysis.

Practical and theoretical significance. The main practical value lies in increasing the validity of decisions made when organizing the educational process using distance learning technologies by controlling the quality of educational services as a whole or its individual components. The results obtained can be used by the management personnel of enterprises and organizations in the development of automated quality assessment systems in other areas of economic and industrial activity.

The results of the study, which have theoretical significance, are presented in the form of recommendations on quality management based on the assessment of

differentiated and complex quality indicators, and can be used in managing the quality process of educational services, regardless of the format of its provision.

It is submitted for protection:

– a criterion model for assessing the quality of provision and organization of the educational process with distance learning technology;

– algorithms for processing and analyzing questionnaires and forming a pool of criteria that, through instrumental software tools, implement the developed model and allow us to assess the quality of the provision and organization of the educational process with distance learning technology;

– the results of an experiment to assess the quality of the provision and organization of the educational process with distance learning technology according to the criteria proposed in the dissertation research.

Approbation of the work. The approbation was carried out in the Non-profit Joint-stock Company "North Kazakhstan University named after M. Kozybayev" (Republic of Kazakhstan). According to the results of the dissertation research, the following author's certificates were obtained (Appendix A):

1. Certificate of entry of information into the State Register of Rights to Copyrighted Objects No.27664 dated July 5, 2022 "Criterion model for assessing the quality of provision and organization of the educational process with distance learning technology";

2. Certificate of entry of information into the state register of Rights to copyrighted objects No. 36083 dated May 18, 2023 "Results of an experiment to assess the quality of provision and organization of the educational process with distance learning technology".

3. Certificate of entry of information into the State Register of Rights to Copyrighted objects No. 42388 dated January 26, 2024 "Methodology for calculating priority vectors and building a criterion model in the SMARTcriterium application".

4. Certificate of entry of information into the state Register of Rights to Copyrighted objects No. 42502 dated January 31, 2024 "SMARTcriterium application interface for assessing the quality of provision and organization of the educational process with distance learning technology".

Publications. The main results of the research are reflected in 13 scientific papers, including 2 articles published in international peer–reviewed scientific journals, 4 articles in scientific publications included in the List of scientific publications recommended for publication of the main results of scientific activity, approved by the authorized body, in 7 works - in the proceedings of international scientific conferences.

Personal contribution of the author. The author's personal contribution consists in conducting research substantiating the main provisions submitted for protection, as well as a significant role in the generalization and analysis of the results obtained.

The structure and scope of the dissertation. The dissertation has a classical structure: an introductory part, four sections, a conclusion, a list of sources used and

appendices. The work includes 54 figures, 10 tables and 123 names of the sources used.

The introduction substantiates the choice of the research topic, reveals its relevance, formulates the purpose of the study, defines its tasks, presents the object and subject of the study, reveals the scientific novelty, theoretical and practical significance of the work, highlights the main stages of the study.

The first section examines the current state of assessment of the quality of provision and organization of the educational process with distance learning technology, reveals the essence of the concepts of distance education, distance learning and distance learning technology. The review of foreign and domestic literature devoted to the assessment of the quality of the provision and organization of the educational process with distance learning technology is presented, the task of the study is formulated.

The second section describes the development of a mathematical model for assessing the quality of provision and organization of the educational process with distance learning technology. In the process of development, a functional scheme of the system for assessing the quality of provision and organization of the educational process with distance learning technology was built, a base of criteria for AIS was formed, a criterion model for assessing the quality of provision and organization of the educational process with distance learning technology was built, an empirical study was conducted.

The third section is devoted to the development of an automated system for assessing the quality of provision and organization of the educational process with distance learning technology. In the process of designing the system, its main modules are defined, Use Case diagrams and sequence diagrams are constructed, algorithms are developed and tools are proposed to assess the quality of provision and organization of the educational process with distance learning technology.

The fourth section highlights the issues of quality management and organization of the educational process with distance learning technology. It presents an experiment to assess the quality of provision and organization of the educational process with distance learning technology according to the proposed criteria and an analysis of its results, provides recommendations on quality management of provision and organization of the educational process with distance learning technology.

In conclusion, the research results are presented, including the main conclusions based on the results of the dissertation research.