ABSTRACT

for the dissertation of Zhanat Serikbaevna Umirzakova submitted for the degree of Doctor of Philosophy (PhD) in the educational program 8D01502 – Informatics on the topic: "Improving the methodology of training future informatics teachers in the context of a student-centered approach"

At present, ongoing changes and global transformations in the education system require a revision of the requirements for the professional training of future teachers. One of the key tasks in improving the educational system of the Republic of Kazakhstan is the creation of a flexible, innovative, and technologically equipped educational environment focused on students. In this regard, organizing the professional training of future teachers in a new format has become a necessity.

The 21st century is marked by an active transition from an information society to a digital one. This transition necessitates changes in educational content, the modernization of teaching methods, and the consideration of individual student needs. The rapid development of digital technologies such as artificial intelligence, cloud computing, big data, virtual and augmented reality, makes the formation of digital competence in education increasingly important.

The training of future informatics teachers deserves special attention, as they are not only subject instructors but also key figures in preparing students to live and work in a digital society. To fulfill this role effectively, future teachers must receive high-quality professional training, which, in turn, requires the implementation of a student-centered approach in education.

A student-centered approach is a modern pedagogical method that enables learners to participate actively and consciously in the educational process, taking into account their individual needs, interests, and abilities. This approach transforms the content, structure, and organization of education: learners become active participants, while teachers act as guides, consultants, and facilitators.

Currently, the systematic application of the student-centered approach in training future informatics teachers is not sufficiently ensured. Research and pedagogical practice show that methodologies based on this approach lack solid theoretical foundations and require further development of methodological support and practical tools.

Although the use of digital platforms and resources in educational institutions is expanding, effective integration with student-centered teaching practices remains underdeveloped. There is a noticeable lack of methodological tools and models for organizing group work, providing feedback, personalizing learning, and enhancing student engagement.

The relevance of the study is determined by the need for theoretical and methodological improvement of the student-centered approach in training future informatics teachers. This approach not only boosts students' cognitive activity

but also helps develop their professional competencies, build individual learning trajectories, and utilize modern technologies effectively.

Research goal – to develop a scientifically grounded methodology for student-centered pedagogical activity in the training of future informatics teachers.

Object – the teaching process based on a student-centered approach.

Subject – the methodology of organizing student-centered activities in the training of future informatics teachers.

Hypothesis – if the training of future informatics teachers is systematically organized as a student-centered activity, it will increase the effectiveness of the educational process and foster the development of key student skills, as student-centered learning is an integral part of educational and technological processes.

Methods – theoretical analysis and synthesis of pedagogical, psychological, and methodological literature, analysis of dissertations, educational standards and programs, student surveys.

Scientific novelty:

– The specific role of student-centered methods in shaping the professional competencies of future informatics teachers is identified.

– A methodology has been developed for implementing a student-centered approach to teaching programming languages using the COProg digital platform, taking into account the specific features of the field of informatics and the needs of students.

– A student-centered teaching model is designed, including objectives, principles, methods, and practical applications in teacher training.

– The effectiveness of the methodology is validated through a pedagogical experiment involving feedback and the use of innovative technologies.

Theoretical significance – lies in justifying the necessity of preparing future informatics teachers to apply student-centered methods, which expand pedagogical knowledge and improve the effectiveness of education.

Practical significance – consists in developing a technology-enhanced learning environment that supports group work and feedback mechanisms within student-centered teacher training.

Key points submitted for defense:

– Theoretical and methodological foundations of student-centered training in the context of pedagogical innovation.

– A model for enhancing teacher preparation based on goal-oriented, organizational, content-related, and result-focused components.

– Formation of a new methodology for informatics teacher training using student-centered innovative technologies.

– Empirical validation of the methodology's effectiveness through experimental pedagogical research.

Publications

The research findings are published in 7 scientific works, including 1 article in a Scopus-indexed Q1 journal, 3 articles in international conference proceedings, and 3 articles in journals recommended by the Committee for Quality Assurance in the Field of Science and Higher Education of the Ministry of Science and Higher Education of Kazakhstan.

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7. Ýmirzakova J.S., Şadiev R., Kerımbaev N.N. Chatbottyŋ stýdentke bağyttalğan oqytý ädısı retındegı tiımdılıgı // Fiziko-matematicheskie naýki jýrnaly. – 2023. – №81(1). – B. 223–229.

Structure of the Dissertation

The dissertation consists of an introduction, two chapters, a conclusion, a list of references, and an appendix.