AMERICAN ACADEMIC PUBLISHER

INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

ISSN NUMBER: 2692 - 5206 Volume 6. No 04. Aprel ,2026

SCIENTIFIC AND METHODOLOGICAL FOUNDATIONS FOR TRAINING COMPUTER TECHNOLOGY EDUCATION TEACHERS IN HIGHER EDUCATION INSTITUTIONS

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Abstract

This article analyzes the scientific and methodological foundations for training computer technology education teachers in higher education institutions. It reveals the importance of ongoing changes in the modern education system, competency-based approaches, and the integration of pedagogical and technical knowledge. As a result of the research, innovative approaches aimed at developing the professional competence of future teachers are substantiated.

Keywords: computer technologies, professional competence, pedagogical education, innovative approach, integration, methodology.

Introduction

In the context of rapid development of technology and computer technologies, the socio-economic progress of society is directly dependent on the development of the education system. In particular, the issue of training competitive personnel is one of the priority directions of modern educational policy.

In the Republic of Uzbekistan, reforms, laws, and resolutions aimed at improving the quality of education are contributing to the modernization of the higher education system. This, in turn, necessitates the development of professional competence among future teachers.

The main goal of modern education is to nurture a well-rounded individual who is capable of independent thinking and possesses an innovative approach. From this perspective, ensuring the integration of theory and practice in the process of training computer technology teachers is of great importance.

Although scientific studies related to this topic (N.A. Muslimov, N.I. Taylaqov, O‘.Q. Tolipov, and others) have explored various aspects of teacher training, there remains a need to develop new methodological approaches that meet modern educational requirements.

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Methods

The following scientific methods were used in this research:

- **Theoretical analysis** – identifying the theoretical foundations of the problem through the study of pedagogical, psychological, and technological literature;
- **Comparative method** – comparing traditional and innovative educational approaches;
- **Observation method** – analyzing the educational process in higher education institutions;
- **Systematic approach** – studying the teacher training process as a complex system;
- **Generalization method** – summarizing the obtained results and drawing conclusions.

Theoretical Analysis Method

Definition:

Theoretical analysis is a scientific method aimed at identifying the theoretical foundations of a research problem through the study of existing scientific sources (pedagogical, psychological, methodological, and technological literature).

Main tasks:

- Studying scientific views and concepts related to the topic
- Justifying the relevance of the problem
- Forming the theoretical model of the research
- Clarifying key concepts (e.g., “competence”, “innovative education”)

Application process:

- Studying scientific articles, monographs, and dissertations
- Analyzing legal and regulatory documents
- Comparing foreign and local experiences

Advantages:

- Strengthens the scientific basis of the research
- Helps to deeply understand the topic

Comparative Method

Definition:

The comparative method is used to identify similarities and differences between various pedagogical phenomena, processes, or approaches.

Main tasks:

- Comparing traditional and innovative teaching methods
- Evaluating the effectiveness of different educational systems
- Identifying the most optimal approaches

Application process:

- Developing criteria for comparison
- Analyzing each method based on these criteria
- Generalizing the results

Example:

- Comparison of traditional (teacher-centered) and innovative (student-centered) education

Advantages:

- Enables deeper understanding of the problem
- Helps draw scientifically grounded conclusions

Observation Method

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Definition:

Observation is a method of collecting data by directly studying and analyzing the educational process in real conditions.

Main tasks:

- Identifying the real state of the educational process
- Evaluating teacher and student activities
- Studying the practical effectiveness of teaching methods

Types of observation:

- Direct observation (participation in classroom activities)
- Indirect observation (via video recordings)
- Systematic observation (based on a pre-planned framework)

Application process:

- Defining observation objectives
- Developing observation criteria
- Recording and analyzing results

Advantages:

- Provides real data
- Reflects practical conditions accurately

Limitations:

- Possibility of subjectivity
- Time-consuming

General Conclusion on Methods

When used together, these methods significantly improve the quality of the research:

- Theoretical analysis provides a scientific foundation
- Comparative method evaluates alternative approaches
- Observation method demonstrates practical outcomes

Therefore, the комплекс (integrated) use of these methods is the most effective approach in training computer technology teachers.

Results

The study identified the following key findings:

1. Main Contradictions

- The gap between graduates' knowledge and labor market requirements
- Imbalance between traditional and innovative teaching methods
- Insufficient development of mechanisms for improving pedagogical competence
- Lack of interdisciplinary integration

2. Components of Professional Competence

- Knowledge (theoretical and technical)
- Skills (practical abilities)
- Competence (ability to apply knowledge and skills in real situations)

3. Key Factors in Teacher Training

- Integration of pedagogical and technical knowledge
- Increasing the share of practical training
- Use of modern information technologies
- Implementation of e-learning resources
- Development of students' creative thinking

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4. Innovative Solutions

- Introduction of competency-based education models
- Aligning educational content with labor market demands
- Developing modern assessment mechanisms
- Creating a digital learning environment

Contradictions Between Goals and Approaches

Traditional methods:

- Focused on knowledge transfer
- Teacher-centered
- Students are passive learners

Innovative methods:

- Focused on competence development
- Student-centered
- Students are active participants

Core contradiction:

The education system has not fully shifted from knowledge-based models, while modern demands require competency-based approaches.

Other Key Contradictions

- Teaching methods vs. modern technologies
- Teacher roles (controller vs. facilitator)
- Assessment systems (summative vs. formative)
- Theory vs. practice gap
- Student motivation and activity issues

Discussion

The results indicate that a comprehensive approach is necessary to improve the training process of computer technology teachers.

First, the integration of pedagogical and technological knowledge plays a crucial role in enhancing teachers' professional training. Additionally, competency-based education has become a priority in modern education systems.

Analysis of foreign experience shows that developed countries focus primarily on practical competencies of teachers. Therefore, transitioning from a knowledge-based approach to a competency-based model is essential in the national education system.

Furthermore, the implementation of innovative technologies such as:

- Distance learning
- Electronic textbooks
- Interactive platforms

positively impacts teachers' professional development.

Conclusion

Improving the training process of computer technology education teachers in higher education institutions is one of the pressing issues of modern education.

The study led to the following conclusions:

- An integrated approach is crucial for developing professional competence
- Modernization of educational content is necessary
- Wide implementation of innovative methods and digital technologies is required

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- Strengthening practical training of future teachers is essential

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