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The Role of Innovative Educational Technologies in Training Future

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Abstract: This article is devoted to enhancing the professional activity of teachers in higher education institutions based on continuous research, critical thinking, and transformation of psychological attitudes, as well as the development of innovative ideas. It also emphasizes the necessity for teachers to possess comprehensive knowledge, skills, and competencies regarding innovative technologies, the ability to create and implement novelties, disseminate advanced practices, and evaluate the outcomes of innovative activities.

Keywords: Innovative pedagogical processes, traditional methods, innovative methods, individual-creative approach, systematic activity, creative activity, reflective activity.

Introduction: The implementation of innovative educational technologies in the process of preparing future technology education teachers for pedagogical activity is of paramount importance.

The concept of “innovation” has various interpretations, but it is often understood as the introduction of novelty. In other words, “innovation” implies novelty or change and refers to the process of integrating new tools, methods, methodologies, technologies, and similar resources [1, pp. 243–254].

A modern teacher’s activity is evaluated, among other criteria, by their ability to stay regularly updated with innovations in their field, the latest educational regulatory documents, and to conduct professional activities based on these standards [2, p. 98].

In practice, the nature of innovative pedagogical processes is characterized by:

- the content of obtained results;
- the degree of novelty of implemented proposals;
- the readiness of practitioners for innovative pedagogical activity.

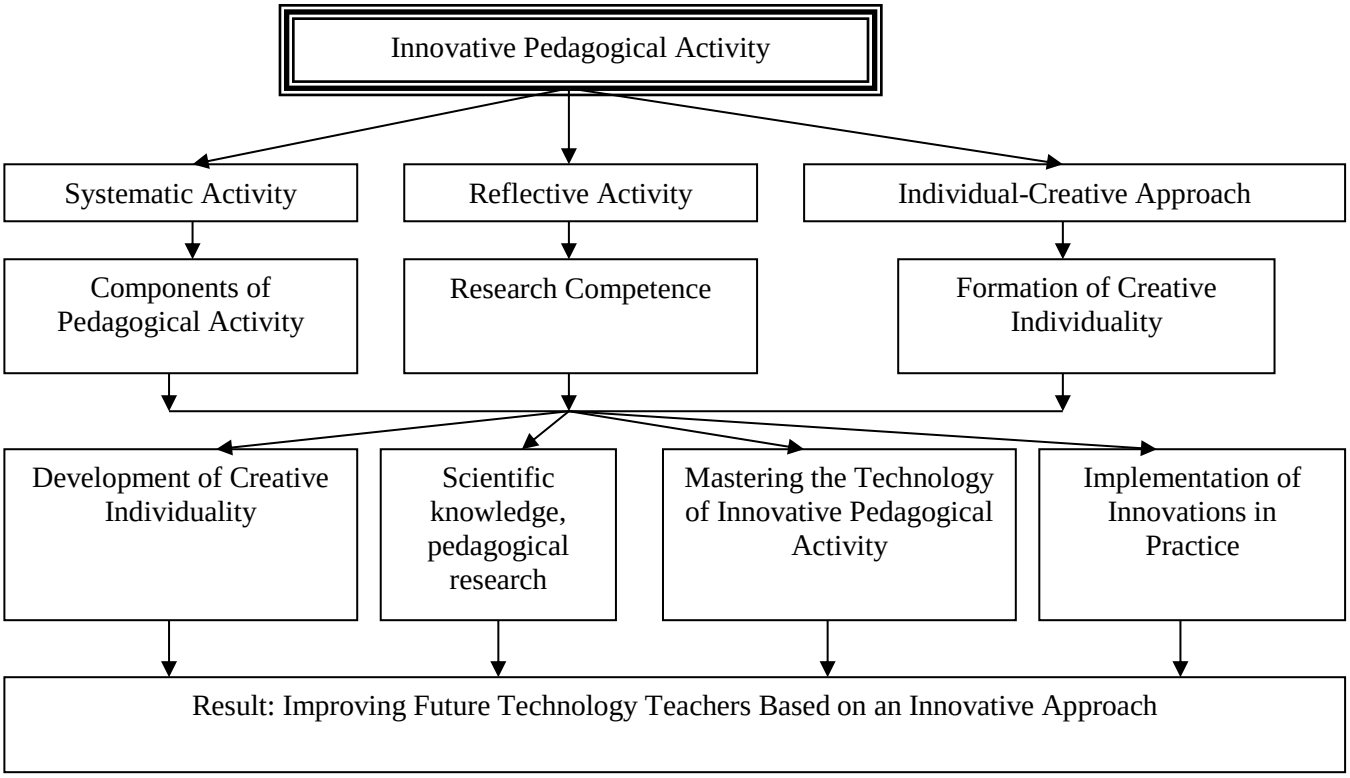

Figure 1. Structure for Improving the Preparation of Future Technology Teachers for Innovative Pedagogical Activity.

The structure for preparing future technology teachers for innovative pedagogical activity has been enhanced (Figure 1). The preparation process of future teachers is conducted based on a systematic, reflective-activity, and individual-creative approach.

From the perspective of the systematic approach, all components of pedagogical education should maximize the stimulation of all elements of innovative pedagogical activity.

Implementing the reflective-activity approach involves developing the ability of future teachers to adopt an active research position regarding themselves and their professional activities.

The individual-creative approach allows future teachers to identify and develop their creative individuality, as well as to reach a personal level that ensures understanding of innovative pedagogical processes [3, p. 160].

The preparation of future teachers for innovative pedagogical activity is implemented in four stages:

1.Stage of Developing Creative Individuality in Future Teachers. This stage focuses on forming the ability of future teachers to identify, analyze, and solve creative pedagogical tasks, as well as to enhance their creative inquiry. It involves applying previously acquired knowledge and skills independently to new situations, perceiving new functions of known objects in a given context, identifying structural components of objects, generating alternative solutions or methods, and adapting previously learned activity methods to new problems. Through this process, they transform these activities into innovative products and develop creative thinking [4, pp. 55–64].

2.Stage of Scientific Cognition and Pedagogical Research by Future Teachers. At this stage, students master the basic methodology of innovative pedagogy, become familiar with the social and scientific foundations and conditions for its development, and study its key concepts [5, p. 188].

3. Stage of Mastering Innovative Pedagogical Activity Technology by Future Teachers.

This stage involves organizing participation in the creation of original programs, mastering the methodology for independently developing such programs, analyzing and forecasting potential challenges in their further development, and applying innovations in educational practice [6, p. 346].

4. Stage of Implementing Innovations in Practice.

This stage includes organizing the practical work of future teachers in experimental settings, conducting corrective actions, and monitoring the outcomes of these experiments. At this stage, future teachers enhance their ability to analyze their professional activity, adjust their perspectives, orientations, and attitudes towards innovations, and develop an innovative mindset [7, pp. 22–36].

The self-development of future teachers is structured based on their knowledge of intellectual work

techniques and the individual characteristics of their cognitive activity. Effective self-development depends on their ability to organize personal time, create an individual self-development plan, and implement it [8, p. 415].

Considering the importance of mastering innovative pedagogical technologies in enhancing the methodological readiness of technology teachers, it is advisable to structure the "Technology Education Methodology" course in sequential stages:

1. Stage 1: Introduce the basic information about the subject.

2. Stage 2: Discuss current achievements and challenges in the field.

3. Stage 3: Present theoretical principles in depth.

4. Stage 4: Provide materials for feedback.

5. Stage 5: Assess proper assimilation of studied topics using various forms of self-assessment tasks, including oral questions and answers, written assignments, non-standard tests, and case banks, with correct answers provided.

Oral questioning facilitates direct interaction between the teacher and students, and responses are evaluated. Written tasks are designed using key words and phrases as references. When designing assignments, greater emphasis should be placed on interactive methods, as their application develops the professional competence of technology teachers [8, p. 30].

A teacher can conduct a lesson using either traditional methods or innovative educational technologies. In traditional lessons, it is often difficult to determine whether the objectives have been achieved, which may lead to a decline in lesson quality. To fundamentally improve traditional lessons, modernize the methodological training of future technology teachers, and enhance the effectiveness of contemporary lessons, it is necessary to conduct lessons using these innovative technologies [10, p. 24].

The aim of modern lessons is to increase students' learning outcomes. When teaching the course "Technology Education Methodology", sessions should be conducted in a meaningful and clear manner, introducing innovations into students' future pedagogical practice, applying interactive methods, and achieving effective self-assessment. Modern lessons teach future technology teachers to think independently and logically, foster creativity, conduct research, analyze information, and draw accurate conclusions.

In higher education, the primary form of teaching organization is the lecture. Lectures present theoretical materials, the main ideas, concepts, theories, and practical issues of the "Technology Education Methodology" course.

Preparation for lectures includes:

- ensuring the scientific rigor of theoretical materials, focusing on evidence and practical problems;
- developing lecture plans and outlines;
- selecting relevant materials for recording;
- determining experimental methods and developing appropriate methodologies;
- planning interdisciplinary and intra-disciplinary connections;
- delivering the lecture according to the plan;
- enhancing students' cognitive activity during the lecture [11, p. 170].

The quality of a lecture can be assessed based on the following criteria:

1. Content: presence of scientific perspectives, methodological questions, accurate discussion of issues and problems.

2. Lecture methodology: clarity of structure and presentation, explanation of key terms, provision of primary and supplementary literature, highlighting key materials, drawing conclusions after questions, use of visual and technical aids, and presentation of problematic material.

3. Management of learning activities: teaching students to take notes, monitoring, and checking their work during the lecture.

4. Lecturer characteristics: knowledge of the subject, accuracy of statements, teacher's appearance, classroom presence, monitoring, and interaction with students.

5. Lecture conclusion: completeness of information, educational value, developmental potential, and didactic-methodological objectives.

During lectures, demonstrations can be conducted according to their content and didactic purpose:

Observation experiments; problematic experiments, in which problematic situations are created and resolved during the lecture.

Concluding experiments: practical exercises using data collected from several topics.

Effective Practices and Practical Work.

Effective practices are applied to increase students' engagement and interest. Practical work refers to learning activities aimed at deeper mastery of the

subject, including laboratory work, exercises, and seminars. Practical work serves to deepen, reinforce, and apply theoretical materials presented in lectures [12, p. 23].

Lectures can take various forms, including: problem-oriented, demonstrative, press conference style, comprehensive generalizing, dual-specialist, interactive dialogue, and scientific-interactive lectures. When covering lecture topics, one of these interactive formats is employed. The lecture format allows the use of interactive technologies based on scientific principles.

The main components of a scientific-interactive lecture are:

- Clearly stating the lecture's objectives and tasks;
- Using scientific hypotheses and methods of proof to reveal lecture content;
- Presenting lecture results as evidence-based knowledge, engaging students in analysis through interactive questioning;
- Summarizing new knowledge by the lecturer;
- Highlighting new key terms and phrases at the end of the lecture for students' attention [13, p. 21].

According to foreign researchers such as Robert B. Barr and Jon Tagg, modern education is based not on teaching but on teaching students how to learn effectively. They explain the essence of teaching and learning paradigms through comparison. To implement the paradigm shift from "teaching to learning, from delivering education to acquiring education," they propose a set of innovative methods. Scholars such as Benjamin Blum, David Jak, Robert B. Barr, and Jon Tagg recognize this transition as the new paradigm of contemporary higher education [14, p. 22].

Complex questions posed by the teacher serve as tools to manage the cognitive abilities of future technology teachers. An experienced teacher, using activating questions, fosters students' creative and independent thinking, encourages reflection, generalization, comparison, recognition of similarities and differences, and the full development of ideas, conclusions, and proposals.

Innovative educational technologies consist of a system of forms, methods, and tools of teaching and upbringing. Their application ensures the methodological preparation of future technology teachers and guarantees the achievement of outcomes in improving and developing their professional competence [15, pp. 74–75].

To enhance the quality of methodological preparation of future technology teachers through an innovative approach, it is essential to implement extensive research activities within the pedagogy departments of higher education institutions. Such research engages the interests of professors and instructors, involves students in investigations, and provides them with opportunities to deepen their understanding of their discipline and contribute to scientific knowledge. Involving future technology teachers in research activities and integrating research outcomes into the educational process ensures educational integration and lays the foundation for the development of competitive technology teachers [16, p. 21].

In higher education pedagogy, it is crucial for teachers to engage in continuous research, think critically, adjust their psychological approaches, and operate based on the development of innovative ideas. Teachers must possess knowledge of innovative technologies, the ability to create and implement innovations, disseminate and popularize advanced practices, and evaluate the results of innovative activities. Only under these conditions can well-prepared, knowledgeable, dedicated, and skilled technology teachers be trained for the future.

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