

RESEARCH ARTICLE

Pedagogical And Methodological Foundations For Developing Logical And Critical Thinking In Future Educators

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Abstract

This article provides an extensive analysis of the pedagogical and methodological foundations for developing logical and critical thinking in future educators. The role of logical thinking in the modern education system, its significance in the formation of professional competencies, and the factors of developing the intellectual potential of future educators are scientifically highlighted. Additionally, the possibilities of problem-based learning technology, interactive methods, digital pedagogy, a reflexive approach, and research activities in developing logical thinking are examined. The article analyzes effective mechanisms for developing analytical and critical thinking in students based on the experience of Cambridge University in the UK. The research results demonstrate that developing logical thinking in the professional training of future educators is one of the important factors in increasing educational efficiency.

KEY WORDS

logical thinking, critical thinking, future teacher, pedagogical competence, analytical thinking, reflexive approach, problem-based learning, innovative technologies, Cambridge experience, digital pedagogy.

INTRODUCTION

In the 21st century, the acceleration of social development, the development of science and technology, and the expansion of the global information space pose new tasks for the education system. Today, the modern education system is focused not only on imparting knowledge but also on developing an individual's intellectual potential and fostering independent and critical thinking skills. From this perspective, the development of logical and critical thinking in future educators is one of the important directions of pedagogical education.

Logical thinking refers to a person's ability to consciously analyze events, identify cause-and-effect relationships between them, systematically express thoughts, and draw scientific conclusions. Critical thinking, on the other hand, is characterized by the in-depth analysis of information, its

evaluation, the comparison of different views, and the making of well-founded decisions. These types of thinking play an important role in a teacher's professional activity.

Today's modern educator appears not only as one who conveys ready-made knowledge to students but also as a person who guides them toward independent thinking, teaches problem-solving, and encourages creative activity. Therefore, the development of the logical thinking of future educators is of current importance not only theoretically but also practically.

Large-scale reforms are being implemented in our country to modernize the higher education system, improve the quality of pedagogical education, and create an innovative educational environment that meets international standards. In this process, special attention is paid to developing

students' independent and analytical thinking, orienting them toward scientific research, and improving their professional competencies.

The essence and psychological-pedagogical foundations of logical thinking

Logical thinking is one of the most important forms of human thinking, which is formed on the basis of mental operations such as analysis, synthesis, comparison, generalization, abstraction, and inference. In psychology, thinking is regarded as human cognitive activity, representing the process of reflecting reality both indirectly and in a generalized manner. From a pedagogical perspective, logical thinking is one of the key factors ensuring the effectiveness of the educational process. This is because a teacher's activity is regularly linked to analyzing problem situations, determining students' knowledge levels, selecting methods, and making pedagogical decisions.

Logical thinking develops through the following mental operations:

- Analysis - the study of complex phenomena by dividing them into components;
- Synthesis - combining individual parts into a single system;
- Comparison - identifying similarities and differences between objects and phenomena;
- Generalization - drawing general conclusions based on important features;
- Abstraction is the removal of secondary features to highlight the main aspects.

These operations play an important role in shaping the scientific worldview and professional competencies of future educators.

Logical thinking in pedagogical activity is manifested in the following processes:

- effective planning of the lesson process;
- systematic explanation of educational materials;
- taking into account the individual characteristics of students;
- analysis of pedagogical situations;
- assessment of educational effectiveness;

- a creative approach to problems.

A teacher with developed logical thinking can guide students toward independent thinking, teach them to solve problems, and interest them in scientific research.

Critical thinking is recognized as one of the most important competencies in modern education. Because in today's information society, a person is faced with a huge flow of information. Critical thinking is necessary to analyze this data, distinguish between reliable and unfounded information, and make the right decision.

The development of critical thinking in future educators creates the following opportunities:

- analytical evaluation of information;
- making independent decisions;
- effective solution of pedagogical problems;
- developing scientific research skills;
- fostering creative thinking in students.

A teacher with developed critical thinking respects students' opinions, encourages them to think independently, and creates an atmosphere of free communication during the lesson.

As one of the world's leading higher education institutions, Cambridge University pays great attention to developing students' logical and critical thinking in the educational process. One of the university's primary goals is to foster students' scientific thinking, prepare them for independent research, and develop their analytical potential. The "supervision system" model, widely used at Cambridge University, involves students working in small groups with professors and tutors. This system teaches students to conduct in-depth analysis, participate in scientific debates, and justify their opinions.

This approach develops the following competencies:

- analytical thinking;
- justification of arguments;
- conducting a scientific discussion;
- conducting independent research;
- a critical approach to problems.

In the Cambridge education system, students are required not

to memorize ready-made answers, but to analyze the problem, approach it from various perspectives, and draw evidence-based conclusions. Especially in seminar classes and debates, students learn to defend their views. A reflexive approach also plays an important role in the experience of Cambridge University. Students analyze their activities, identify errors, and develop ways to eliminate them. This contributes to the further development of their critical and logical thinking.

Problem-based learning technology

Problem-based learning technology develops students' independent thinking and problem-solving skills. Based on this technology, the teacher poses a specific problem situation to the students and directs them to solve this situation independently.

Problem-based learning has the following advantages:

- develops analytical thinking;
- forms a creative approach;
- teaches to make independent decisions;
- increases interest in scientific research.

Using interactive methods

Interactive methods encourage students to think actively and develop their communicative competencies. The "Brainstorming," "Debate," "Case Study," "Discussion," and "FSMU" methods guide students toward logical thinking.

Through these methods, students:

- working with evidence;
- to justify their opinion;
- analyzing opposing opinions;
- learns to work in a team.

Project-based learning technology

Project-based learning directs students toward solving practical problems. Based on this technology, students work on a specific project, analyze information, and present the results.

Project activity allows students to:

- research skills;
- creative thinking;

- analytical approach;
- information management competence

serves the development.

The development of digital technologies is creating new pedagogical opportunities within the education system. Electronic platforms, multimedia tools, virtual laboratories, and programs based on artificial intelligence elements activate students' independent learning activities.

Digital pedagogy creates the following opportunities:

- rapid analysis of information;
- organization of distance learning;
- creating an individual educational trajectory;
- formation of an interactive educational environment.

Today, media literacy and the culture of working with information are also an important component of pedagogical competence. This is because the educator must not only receive information but also analyze and evaluate it.

To effectively develop logical thinking in future educators, it is important to create the following pedagogical conditions:

- applying innovative methods in the educational process;
- involving students in research activities;
- development of reflexive activity;
- strengthening interdisciplinary integration;
- increasing the share of creative assignments;
- creating an open communication environment.

These conditions not only develop students' independent and analytical thinking but also strengthen their professional training.

Conclusion

In conclusion, the development of logical and critical thinking in future educators is one of the priority areas of modern pedagogical education. Logical thinking is one of the primary indicators of a teacher's professional competence, pedagogical mastery, and innovative activity.

Problem-based learning technology, interactive methods, project activities, independent learning, and digital pedagogy play an important role in developing students' analytical

potential. At the same time, the experience of the University of Cambridge in the UK demonstrates an effective model for developing students' scientific thinking, organizing open discussions, and forming a reflexive approach. In the future, one of the important tasks remains the adaptation of international experience to the national education system, the widespread introduction of innovative pedagogical technologies, and the further improvement of scientific and methodological work aimed at developing the intellectual potential of students.

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