
CONFERENCE ARTICLE

**A DESIGN FOR A MECHANISM TO DEVELOP STUDENTS' CONCEPTUAL THINKING IN THE
HIGHER EDUCATION PROCESS**

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ABSTRACT

This article provides a scientific-theoretical and practical justification for designing a mechanism to develop students' conceptual thinking in higher education institutions. Conceptual thinking is interpreted as a type of intellectual activity that forms students' competencies in systematizing knowledge, identifying interconceptual relationships, making well-grounded decisions in problem situations, and conducting reflective analysis. The study systematizes the structural stages, pedagogical conditions, and methodological tools for designing a mechanism to develop conceptual thinking. As a result, an integrative pedagogical model aimed at developing conceptual thinking and criteria for evaluating its effectiveness were developed.

KEYWORDS

Conceptual thinking, higher education, mechanism, design, competence, reflection, metacognitive approach, integrative model, problem-based learning.

INTRODUCTION

In the higher education system, the effectiveness of training modern specialists is determined not only by students' acquisition of ready-made knowledge, but also by their ability to analyze, process, generalize it, and create innovative solutions in practical situations. From this perspective, developing students' higher-level intellectual activity in the learning process—particularly forming conceptual thinking—has become one of the most urgent tasks.

Conceptual thinking reflects a student's ability to deeply understand key concepts related to a topic, connect them systematically, apply theoretical knowledge to real and problem situations, and draw scientific conclusions using conceptual maps and models. In this process, students' scientific reasoning, reflective approach, logical thinking, and metacognitive control mechanisms function actively. Conceptual thinking is also recognized as an intellectual process that elevates learning content from the level of "memorizing" to the level of "understanding, explaining, generalizing, and creating." In this regard, designing a mechanism for developing students' conceptual thinking in higher education is an актуальная (urgent) scientific and practical problem, and it requires integrating methods, didactic technologies, pedagogical conditions, and an assessment system within a unified conceptual framework. This is because the expected effectiveness can be achieved only when the development of conceptual thinking is organized not as a random or episodic activity, but on the basis of a systematic mechanism oriented toward clear goals, content, and outcomes.

Conceptual thinking in higher education expands students' opportunities to deepen knowledge meaningfully and manage it on a scientific basis. This type of thinking enables students to systematize and hierarchize knowledge, identify logical connections between concepts, generate solutions in problem situations, apply theoretical knowledge to practice, and monitor their own thinking process through reflection. Therefore,

conceptual thinking is regarded as one of the key outcome indicators of the competency-based approach in higher education.

To organize the formation of students' conceptual thinking effectively, it is necessary to design the mechanism based on clear structural components. The proposed mechanism includes the following components:

The goal-oriented component is aimed at forming and consistently developing students' conceptual thinking competence.

The content component covers the system of knowledge necessary for developing conceptual thinking. In this context, key concepts (concept, category, principle, model), thinking operations (analysis-synthesis, generalization, analogy), and interdisciplinary integration are identified as the main content directions.

The activity-technological component includes teaching methods and technologies that serve to develop students' conceptual thinking. In this process, problem-based learning, project-based learning, case study, concept mapping, discussions and debates, and reflective tasks (essays, a "thought diary," SWOT analysis) are used as effective tools.

The organizational-pedagogical component ensures the methodologically correct organization of the educational process. Within it, cooperative learning, learner-centered education, support for academic independence, and the creation of a creative environment emerge as priority conditions.

The diagnostic-assessment component serves to determine the level of development of conceptual thinking and to conduct monitoring. Within this component, the following criteria are defined: the cognitive criterion (understanding concepts, scientific consistency); the operational criterion (analysis, synthesis, constructing a concept map); the reflective criterion

(evaluating one's own thinking, recognizing errors); and the creative criterion (innovative approach, original solution).

In order for the mechanism for developing conceptual thinking to be implemented systematically and sequentially in educational practice, it was designed as a staged model. The proposed mechanism is organized on the basis of three stages.

Stage 1: Diagnostic–motivational stage. At this stage, the student's level of conceptual thinking is identified; learning motivation and goal orientation are formed; and the role and importance of conceptual thinking in the educational process are substantiated.

Stage 2: Developmental–practical stage. This stage is the central part of the mechanism. Here, the student's thinking is activated through problem situations, and activities such as constructing concept maps, solving cases, and developing projects are carried out. In this process, the teacher performs not the role of a transmitter of knowledge, but that of a facilitator who guides and supports.

Stage 3: Reflective–result stage. At this stage, students' conceptual growth is monitored; self-assessment and collective analysis are established; results are consolidated through portfolios; and final diagnostics are conducted according to development indicators.

The research results show that certain pedagogical conditions are decisive for the effective implementation of the mechanism for developing conceptual thinking. In particular, creating a problem- and research-oriented learning environment, ensuring interdisciplinary integration and using tasks based on real-life situations, regularly applying concept mapping and reflection technologies, and combining diagnostic and developmental forms of assessment increase the practical effectiveness of the mechanism. As a result, the student forms a "scientific worldview" oriented not toward simply "memorizing" knowledge, but toward drawing scientific conclusions through structural processing of knowledge.

Designing a mechanism for developing students' conceptual thinking in higher education is one of the key factors that increases educational effectiveness. When the goal-oriented, content, activity–technological, organizational–pedagogical, and diagnostic–assessment components of this mechanism are applied in integration, students' higher-level thinking activity, scientific analysis skills, and reflective competence develop consistently. The proposed staged model, in turn, helps ensure the practical implementation of the competency-based approach in higher education and serves to purposefully shape students' conceptual thinking.

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