

**METHODOLOGY FOR DEVELOPING META-SUBJECT COMPETENCIES IN  
FUTURE PRIMARY SCHOOL TEACHERS**

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**Abstract**

This article is devoted to the methodology for developing meta-subject competencies in primary school students. It provides a detailed discussion of the concepts of cognitive, communicative, regulatory, and information-processing competencies, their content, and methods for their development. Additionally, the effectiveness of applying integrative approaches, problem-based learning, project activities, and reflection tools in the preparation of future primary school teachers is considered. The article highlights the importance of meta-subject competencies in supporting the intellectual and social development of students in modern educational contexts.

**Keywords**

meta-subject competency, primary education, cognitive skills, communicative skills, regulatory competency, information processing, pedagogical methodology

The modern education system operates in the context of globalization, digitalization, and a sharp increase in information flow. Today, the volume of knowledge is rapidly updating, the content of professions is changing, and society increasingly demands adaptability and creativity. In this situation, students are required not only to acquire theoretical knowledge within individual subjects but also to be able to apply it in various situations, understand interdisciplinary connections, think critically and systematically, and find effective solutions in problem situations—i.e., to develop universal competencies.

In this regard, meta-subject competencies are becoming one of the central concepts of modern education, as they transform the process of learning into an active, conscious, and goal-oriented activity. The meta-subject approach sees the student not as a passive listener but as an active participant in the educational process. It is necessary for the student to be able to apply the knowledge they acquire in real-life situations, draw independent conclusions, and substantiate their own opinions.

The development of digital technologies also increases the importance of meta-subject competencies. Working with information, critically analyzing it, distinguishing reliable sources, and presenting results are all factors that define a student's general educational preparedness. Additionally, communicative and social competencies play a crucial role in teamwork, collaboration, and engagement in intercultural communication.

Primary education is one of the most important and responsible stages in a child's personal development. During this period, a child's cognitive processes become more active, their interest in the surrounding environment increases, and a conscious attitude toward learning begins to form. According to scientific sources, the age range of 6–10 years is a decisive period for a child's intellectual and social development. During this stage, the foundations of thinking processes, learning motivation, communication skills, and behavioral norms are established.

At this age, students learn to express their thoughts orally and in writing, collaborate with peers, and independently find solutions to simple problem situations. If the educational process is organized scientifically, systematically, and purposefully, a solid foundation is laid for the

student's successful learning in subsequent educational stages. Otherwise, negative outcomes such as indifference toward learning, lack of confidence, and passivity may arise.

In primary grades, students particularly develop a positive attitude toward learning, self-confidence, and the ability to work independently. In this process, the professional skills of the teacher play a decisive role. A modern primary school teacher should not only be a knowledge provider but also a guide, motivator, creator of a collaborative environment, and supporter of students' personal development. In the preparation of future primary school teachers, it is crucial to thoroughly teach the methodology for developing meta-subject competencies. The meta-subject approach helps cultivate in students the ability to think across disciplines, analyze problems, make independent decisions, and evaluate their own activities.

In the teacher training system, it is first and foremost necessary to develop students' critical and creative thinking skills. Only a teacher with a creative approach can inspire students to think independently. Additionally, developing the skills to design lessons based on interdisciplinary integration is important. This enables future teachers to present content from various subjects in an interconnected way and help students form a comprehensive understanding.

Furthermore, students should be taught methods for organizing independent learning activities for their future pupils. Techniques such as planning independent work, creating problem-based situations, and developing small research assignments increase students' engagement and sense of responsibility. The application of reflection and self-assessment mechanisms also strengthens the professional competencies of future teachers, as these processes develop students' skills in analyzing their own activities and drawing conclusions from mistakes.

The process of pedagogical practice provides an opportunity to integrate theoretical knowledge with a real educational environment. During their practice, students need to gain experience in lesson planning based on a meta-subject approach, engaging learners actively, creating problem-based situations, and analyzing them. It is through practical activities that future teachers develop and refine their professional skills.

**The Concept and Essence of Meta-Subject Competency.** In modern education, the concept of meta-subject competency refers to a student's ability to go beyond a single subject area and apply the knowledge and skills acquired in various situations. Such competencies facilitate the effective organization of a student's overall learning activities and ensure interdisciplinary connections. The meta-subject approach does not limit the educational process to mere content acquisition; it also supports the development of students' thinking, independent work skills, and personal growth.

In the system of meta-subject competencies, skills related to cognitive, communicative, regulatory, and information-processing areas are interconnected and mutually reinforcing. Each of these plays a crucial role in the intellectual and social development of students.

1. **Cognitive Competencies.** Cognitive competencies reflect a student's ability to engage actively and consciously in the learning process. This competency shapes the student not merely as a passive memorizer of information but as an active subject capable of understanding, analyzing, and generating new knowledge. Through cognitive development, a student's thinking expands, and skills in logical consistency and independent reasoning are strengthened.

Within this competency, a student acquires mental operations such as analysis, comparison, generalization, identifying cause-and-effect relationships, and drawing evidence-based conclusions. For example, in native language lessons, analyzing the content of texts, identifying main ideas, and explaining the sequence of events help develop logical thinking. In mathematics classes, deeply examining a problem, comparing different solution methods, and choosing the optimal approach fosters analytical reasoning.

To develop cognitive competencies at the primary education stage, effective methods include posing problem-based questions, providing logical tasks, and organizing lessons based on experiments and observations. This approach increases students' interest in learning, encourages independent thinking, and gradually develops their intellectual potential. Thus, cognitive competencies, as a core component of the meta-subject competency system, ensure that students understand, process, and apply knowledge in practice. This, in turn, enhances educational effectiveness and contributes to the formation of a well-rounded individual.

2. Communicative Competencies. Communicative competencies reflect a student's ability to express their thoughts clearly, coherently, and based on evidence during interactions, to listen attentively to others, and to work collaboratively. This competency holds particular importance in the educational process because knowledge is deepened not only through individual learning but also through mutual exchange of ideas, discussion, and cooperation.

Communicative competency includes skills such as developing oral and written language proficiency, asking questions and responding logically, showing respect to conversation partners, and accepting diverse viewpoints. In primary grades, this process is especially important, as students learn to express themselves openly, interact with peers, and find their place in social environments.

For example, during group work, a student discusses a problem collaboratively, shares their suggestions, considers others' opinions, and participates in reaching a collective conclusion. Such activities foster a culture of cooperation, mutual respect, and a sense of social responsibility. Role-playing games, debates, short presentations, and team tasks are effective tools for developing communicative competencies. As a result, students become open to communication, able to express their ideas freely, and prepared to work effectively in a team.

3. Regulatory Competencies. Regulatory competencies refer to a student's ability to consciously plan, organize, and monitor their own learning activities. This competency plays a key role in developing a student's independence, responsibility, and discipline. A student with well-developed regulatory skills can set goals, determine ways to achieve them, and analyze the outcomes.

Within this competency, a student first understands the purpose of the task at hand and then plans the steps to accomplish it. During the activity, they monitor their actions, identify mistakes, and make corrections if necessary. At the end of the lesson, they evaluate the results of their work and reflect on their performance. This process develops the student's self-management skills.

Reflection is an integral part of regulatory competency. By asking questions such as "What did I learn today?", "What difficulties did I encounter?", and "What should I improve in the future?", students analyze their own activities. This approach enhances the student's motivation for self-improvement and transforms them into an active manager of their own learning process.

4. Information-Processing Competencies. Information-processing competencies refer to a student's ability to search for information from various sources, analyze, sort, organize, and present it in a clear and understandable way. In today's information society, where the flow of information has increased dramatically, this competency has become essential and indispensable for every student.

Within this competency, students learn to distinguish reliable and important information, separate it from excessive or incorrect data, and systematically represent the information in tables, diagrams, charts, or text. To develop these skills in primary education, effective activities include text analysis, creating stories based on images, and constructing simple tables and diagrams. Additionally, the use of digital tools enhances students' information literacy and prepares them to work with modern technologies.

Students taught using a meta-subject approach do not develop as passive recipients of ready-made knowledge but as active subjects. They should be able to apply their knowledge in various situations, understand interdisciplinary connections, and develop the ability to generate independent solutions.

Theoretical Foundations of Preparing Future Teachers. The process of preparing future primary school teachers should be based on a competency-based approach. In this approach, students acquire not only theoretical knowledge but also develop practical skills. Special attention should be given to reflective activities, as well as the extensive use of interactive methods and pedagogical technologies.

In institutions of higher pedagogical education, it is recommended to focus on the following:

Explaining the content of meta-subject competencies to students and teaching them how to apply these competencies in practice;

Teaching the methodology of lesson design based on interdisciplinary integration;

Developing skills in applying innovative pedagogical technologies;

Modeling real pedagogical situations in practical classes and training students to participate actively in them.

Methodology for Developing Meta-Subject Competencies

Developing meta-subject competencies is an important task in modern primary education. This process is aimed at cultivating students' ability to think independently across subjects, communicate effectively, solve problems, and manage their own learning. Below are some effective methodological tools for developing these competencies.

1. Integrative Approach. Organizing lessons based on interdisciplinary connections is one of the most effective ways to develop meta-subject competencies. This approach helps students understand the relationships between different subjects and reinforces knowledge. For example, in native language lessons, elements of mathematical logical thinking can be applied during text analysis, or in natural science lessons, observation results can be presented in writing to develop communicative competencies. Through the integrative approach, students learn to apply acquired knowledge in various contexts.

2. Problem-Based Learning Technology. Creating problem-based situations fosters independent thinking and creative approaches in students. This method encourages learners not just to memorize ready-made answers but to explore multiple solutions. Future teachers need to learn how to formulate problem-based questions, organize debates, and use the case study method. Problem-based learning enables the simultaneous development of cognitive, communicative, and regulatory competencies in students.

3. Project-Based Activities. The project method helps students develop skills in planning, information searching, and teamwork. Through this approach, students engage in independent activities and learn to integrate interdisciplinary knowledge in practice. For example, during small projects such as "My Neighborhood" or "Protecting Nature," students combine knowledge from different subjects to solve problem-based tasks and discuss the results within their groups. This process teaches them to collaborate effectively and find creative solutions.

4. Reflection and Self-Assessment. The reflection process at the end of a lesson supports the development of regulatory competencies. By asking questions such as "What did I learn today?" or "What difficulties did I encounter?", students analyze their own performance and draw conclusions from mistakes. Reflection allows students to evaluate their work, improve themselves, and develop independent decision-making skills. In this way, students not only acquire knowledge but also learn self-management and how to work on their own development.

By applying these methodological tools in combination, future primary school teachers can comprehensively develop cognitive, communicative, regulatory, and information-processing

competencies in their students. This contributes to nurturing independent, creative, and capable individuals who meet the demands of modern education.

**Methodology for Developing Meta-Subject Competencies.** Developing meta-subject competencies is one of the main tasks of modern primary education. This approach aims to cultivate students' interdisciplinary thinking, independent decision-making, communication, and collaboration skills, thereby enhancing their personal and intellectual potential. In the preparation of future primary school teachers, mastering this methodology thoroughly is extremely important.

**Integrative Approach.** Organizing lessons based on interdisciplinary connections is one of the most effective ways to develop meta-subject competencies. Through this approach, students can integrate knowledge from different subjects and apply it in practice. For example, in native language lessons, elements of mathematical logical thinking can be incorporated during text analysis, or in natural science lessons, observation results can be presented in writing to develop communicative competencies. The integrative approach strengthens students' knowledge and enhances their ability to understand interdisciplinary connections.

**Problem-Based Learning Technology.** Creating problem-based situations fosters independent thinking and creative approaches in students. This methodology encourages learners not merely to accept ready-made answers but to explore multiple solutions. Future teachers need to learn how to formulate problem-based questions, organize debates, and use the case study method. In this way, cognitive, communicative, and regulatory skills are developed simultaneously.

**Project-Based Activities.** The project method develops students' skills in planning, information searching, and teamwork. Through small projects, students integrate knowledge from different subjects and solve problem-based situations. For example, projects such as "My Neighborhood" or "Protecting Nature" strengthen students' collaboration and creative thinking, while encouraging independent activity.

**Reflection and Self-Assessment.** Organizing reflection at the end of a lesson supports the development of regulatory competencies. Students analyze their own performance and draw conclusions from mistakes by asking questions such as "What did I learn today?" and "What difficulties did I encounter?" Reflection enables students to evaluate their work, improve themselves, and develop independent decision-making skills.

Thus, by applying an integrative approach, problem-based learning, project-based activities, and reflection in combination, future primary school teachers can comprehensively develop students' cognitive, communicative, regulatory, and information-processing competencies. This contributes to one of the main goals of modern education—nurturing independent, creative, and active thinkers.

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