"THE ROLE OF INTEGRATION PRINCIPLES IN DESIGNING THE `NATURAL SCIENCES` COURSE FOR PRIMARY CLASSES"

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Abstract: This article highlights the role and importance of integration principles in designing the "Natural Sciences" (Science) course for primary classes. During the research, issues of ensuring interdisciplinary connectivity in training future teachers, forming holistic concepts of existence in students, and optimizing educational content were analyzed. The article provides recommendations on the didactic possibilities of the integrative approach and the methodological foundations of designing the lesson process.

Keywords: integration, natural sciences, Science, primary education, design, didactic principle, holistic worldview, interdisciplinary connectivity.

Introduction: The development of modern education requires teaching students to understand the world not as a collection of separate subjects, but as a holistic system. Particularly, the psychophysiological characteristics of primary school-age students predispose them to perceive existence not in fragments, but as a whole. For this reason, the "Natural Sciences" (Science) course introduced into the education system combines subjects such as biology, geography, physics, and chemistry combining their fundamentals, it serves as an important link in forming the initial scientific worldview in children.

However, the effective design of this course and its implementation into the teaching process directly depends on the extent to which future teachers master the principles of an integrative approach. Integration is not just the addition of subjects; it means increasing lesson effectiveness and reducing study workload through logical connection of education content. Therefore, preparing future primary school teachers to teach these subjects based on integration principles remains one of the most pressing issues in the field of pedagogy.

Main Part: Today, the integrated approach is considered one of the important methodological directions in the education system. Especially at the stage of primary education, it is necessary to deliver knowledge to students not as separate blocks, but in an interconnected manner. This is because young children perceive the environment as a holistic system. For them, natural phenomena, human activities, and daily life processes appear inseparable from one another. Integration is the process of interlinking and harmonizing the content of various subjects and bringing them into a unified educational system. From a pedagogical perspective, integration serves to form a holistic picture of the world in students. A primary school student does not perceive natural phenomena by dividing them into separate sciences like physics, chemistry, or biology. For this reason, it is appropriate to provide knowledge about nature in the "Natural Sciences" course in a complex manner. For example, when studying the topic of "Air," the student gains a holistic understanding of the properties of air, its importance in the life of living

organisms, atmospheric phenomena, and ecological problems. As a result of such an approach, knowledge is not fragmented; on the contrary, it is systematized. The theory of integrative education is based on a constructivist approach. According to it, a student does not receive knowledge in a ready-made form but forms it independently through observation, experience, and logical connection. In particular, the "Science" course is an effective tool for integrated teaching, as it is organized on the basis of observation, experimentation, and practical activity. Furthermore, the integrative approach develops students` logical thinking, observation skills, analytical abilities, and problem-solving skills in problematic situations. As a result, the student masters knowledge not through memorization, but through understanding. To organize the "Natural Sciences" course effectively, it is required to design it based on scientific and methodological principles. These principles ensure that the educational material is consistent, interesting, and appropriate for the student`s age.

The Principle of Consistency. According to this principle, educational material is arranged in a consistent order from simple to complex. Each new piece of knowledge is provided based on previous knowledge. For example, first the states of water are studied, and then the water cycle is explained. This forms a logical connection in the student.

The Anthropocentric Principle. Natural phenomena are explained in connection with human life. For example, the topic of "Plants" is considered not only as a biological process but also as a source of human food, health, and life. This reveals the practical significance of knowledge.

Ecological Orientation. The idea of preserving nature and forming ecological culture should be embodied in every lesson. For example, lessons about water cover issues such as saving water, protecting the air, and reducing waste. As a result, ecological responsibility is formed in students.

Practical Orientation Principle. Theoretical knowledge is reinforced through practical activity. Experiments, observations, modeling, and laboratory classes help students gain a deeper understanding of the knowledge.

For example, knowledge about plant development is reinforced by observing seed germination. The Principle of Visibility. Since primary school students possess figurative thinking, it is important to use visual aids in lessons — pictures, videos, experiments, and models. This makes the knowledge clear and understandable. The successful application of an integrative approach in primary education largely depends on the methodological preparation of the teacher. A future teacher must deeply understand not only the content of one subject but also interdisciplinary connections.

Integrative competence is the ability of a teacher to link the content of various subjects and design and organize a lesson based on a unified pedagogical goal. The following steps are important in forming this competence:

Identifying interdisciplinary connections: The teacher should find points of connection with other subjects for each topic. For example, the topic "Light" is linked with physics, "Plants" with biology, and "Change of Seasons" with geography.

Creating problem situations: Students` research activities are stimulated by asking them interesting questions. For example: "Why does ice melt?", "Why do plants reach for the sun?". These questions encourage the student to observe and think.

Use of ICT tools. With the help of digital technologies, it is possible to organize virtual laboratories, animations, and interactive tasks. This increases the effectiveness of integrated

lessons. Lessons organized on an integrative basis help students to be actively involved in the learning process. In such lessons, the student is not just a listener, but an active participant.

The effectiveness of integrated lessons is manifested in the following: students` interest in knowledge increases; knowledge is formed systematically; interdisciplinary connections are understood; independent thinking develops; and practical skills are formed. Research shows that integration lessons significantly increase students` activity and interest compared to traditional ones. This is because knowledge is linked to real life. For instance, if the topic "Water Cycle" is taught through experiments, videos, and observations, the student not only understands the process but also visualizes it in practice. Furthermore, integrated education saves time, reduces repetition of topics, and enriches educational content. As a result, a scientific and conscious attitude towards nature is formed in primary school students.

In conclusion, designing the "Natural Sciences" course in primary education based on an integrative approach serves to form a holistic concept of nature in students. This approach creates an opportunity to master knowledge not in isolation by subject, but in continuous connection. Through integration, the content of lessons is enriched, student activity increases, and practical skills develop. Therefore, preparing future primary school teachers to design lessons based on an integrative approach is one of the priority tasks of modern pedagogy.

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