

The Importance of an Integrated Approach in Improving the Effectiveness of Teaching Natural Sciences

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ABSTRACT

In modern conditions, it is important to focus on the development of the personality, socialization, and training of independent, critical, and creative thinking abilities according to all the possibilities of the educational process. logical thinking, scientific and technical development, strengthening of educational activities, awareness of existence, and enrichment of thoughts are of great importance in the full understanding of nature.

In today's globalization, education plays an important role in the development of the student in all aspects, in the formation of perfection and the qualities characteristic of a qualified specialist. , requires the creation of necessary conditions for their thorough mastering of various scientific bases. In modern conditions, it is important to focus on the development, socialization, and training of independent, critical, and creative thinking abilities of the individual according to all the possibilities of the educational process. Education that can show these possibilities is called person-oriented education. Person-oriented education is education aimed at the development of the student's personality, characteristics, and abilities, taking into account the student's thinking and action strategies. means that it will be adapted to its capabilities. According to him, the educational environment, pedagogical conditions, and educational and upbringing process fully realize the student's potential, develop his abilities, ensure his maturity as a person, and enrich his thinking and worldview. This type of education serves to educate students on such qualities as independence, initiative, and responsibility, as well as independent, creative, and critical thinking skills. One of the most important tasks of the educational process is its development. For the educational process to successfully fulfill its developmental task, the content of the topics requires special methodical treatment, the educational process is organized uniquely, and deep penetration into the psychology of each student is required. In the organization of modern lessons, the teacher should thoroughly master new pedagogical technologies and take a creative approach to each lesson. Nowadays, the integrated teaching of natural sciences is also widely implemented. Including, the organization of lessons based on STEAM approaches in general secondary schools.

Integration (Lat. integration — restoration, filling, taken from the word integer — whole) is a process of rapprochement and interaction of disciplines, accompanied by differentiation. Integration in education is not a one-sided, but comprehensive development of the student's knowledge and imagination of the world. is achieved. Interdisciplinarity (integration) is the basis for the formation of a scientific worldview and introduces and teaches the student the correct and full understanding of nature, logical thinking, and the use of information technologies in practical activities for scientific and technical development.

Integration is divided into two:

External integration-Mathematics, Biology, Chemistry, Geography, History, Literature, Informatics.

Internal integration - inter-topic connection, connection, and coherence of topics. The results of the integrated lesson are also reflected in the development of creative subjects by the teachers. Interdisciplinary integration is not to show the related areas of several educational subjects but to give students an idea of the integrity of the world around us through integrated teaching. Scientists say that integration accelerates the formation of a student's worldview. The following levels of integration can be defined.

1. Thematic (topical) integration 2. Problematic integration 3. Conceptual integration 4. Theoretical integration In thematic integration, two or three different subjects reveal one topic. This level can be called illustrative-descriptive. Solving one problem with different possibilities of the subject is problematic integration. In conceptual integration, one concept is considered using the tools and methods of various educational subjects. The philosophical integration of various theories is theoretical integration. For example, in connection and integration of chemistry and ICT, theoretical information, or virtual laboratories, necessary slides are shown using ICT tools. When passing the subjects, interdisciplinary harmony is visible. In the successful process of information acquisition and processing of students in front of the educational system, the teacher himself is a consultant, a guide, and a teacher. becomes the manager of the process. The teacher entrusts information technologies with the functions of the source and distributor of information. In this, the main issue depends on entering the world of knowledge, using and mastering the resources of this world. In the field of educational sciences, it is necessary to receive news and be able to process it. methods related to color and image are coming to the fore. Below we will consider the integration of chemistry with the sciences of biology, ecology, and geography. Chemistry and Biology 1. Without which metal a plant cannot be green? (magnesium) 2. What is the name of the substance with which venous blood is saturated? (CO₂) 3. Starch is converted into this substance under the action of enzymes in the oral cavity. What is it? (glucose).

Daily life and chemistry 1. What is the common name for sodium bicarbonate? (Beverage soda). 2. It is easy to clean a hand with a watermark. What is it? (vegetable oil). 3. It is impossible to store alkaline and acidic solution in a container made of this metal. What metal is it about? (Aluminum). 4. Fruit and juice stains can be easily removed with the help of this medicine. What is it? (hydrogen peroxide). 5. P(red)+ Bertholte salt = What is the importance of this reaction in life? (combustion reaction of a match).

Chemistry and Environment 1. Air pollutant metal in the automobile exhaust gas. (lead) 2. What are ozone-depleting substances? (substances containing chlorine and fluorine compounds - freons) 3. Currently, silver is not considered as valuable as it was in the 19th century. Because it darkens quickly in the air. What is the reason for this? (the concentration of hydrogen sulfide in the air has increased compared to the 19th century) 4. What do ecologists say about the accumulation of carbon dioxide in the atmosphere? (heat effect) 5. The environmental problem caused by the accumulation of sulfur and nitrogen oxides in the atmosphere (acid rain) Chemistry and geography 1. The world's largest natural bullion of pure gold was found in the

Hill End mine in 1872. It is in the form of a slab. It was 144 cm long, 66 cm wide, 10 cm thick, and weighed more than 90 kg. It was named the Hilterman plate. In which country was this gold found? (Australia) 2. In ancient times, people used various tools to record information and leave it for future generations. In particular, they used the trunk of the papyrus plant as writing paper. Where and in what country does the papyrus plant grow? (Egypt; in the Nile River Delta) 3. The heaviest natural silver ingot (30 kg) was found in 1992 in the Sorsk ore deposit in Russia. Where is the Sorskruda mine located in Russia? (From Magadan) 4. It is known that pure cast iron metal is rare in nature. Pure iron is meteorite iron, which academician Pallas brought to Petersburg from Siberia in 1772. The name of this iron is Pallasov iron. is called The total weight of the fragments of an iron meteorite that fell from the sky to one of the Russian regions was 30 tons. In which region of Russia was this iron meteorite found? (Sikhote Aliens) 5. Formic acid was synthesized for the first time by Andreas Sigismund Marggraf in 1749. The scientist isolated it chemically as a result of studying the fluid separated from yellow ants and cocoon worms. It is known that this insect used acid to protect itself. In addition, formic acid has been found in bee venom, various fruits, animal, and human tissue. What country was this chemist a citizen of? (England).

In short, the integrated teaching of subjects, helps students to develop skills such as creativity, cognition, and independent thinking in the understanding of existence. At the same time, every modern teacher should be able to use innovative forms of education to increase the learning activities of students, increase the quality of teaching and improve their efficiency.

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