

METHODOLOGY OF APPLICATION OF INNOVATIVE EDUCATIONAL TECHNOLOGIES TO THE PROCESS OF PHYSICS AND ASTRONOMY EDUCATION

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Annotation. *This article describes the technology of applying innovative educational technologies to the process of physics and astronomy education. It is known to everyone that one of the main tasks of qualified professors is to clarify effective ways of introducing innovative educational technologies into the educational process of higher education institutions, and to develop methodological recommendations.*

Keywords: *higher education, physics education, astronomy education, educational system, innovation, technology, quality, innovative education, debate.*

Introduction. In the Republic of Uzbekistan, as well as all other sectors, sufficient state attention has been paid to the education sector. The competitiveness, scientific potential, qualifications and experience of our trained personnel are no less than the personnel trained in any developed country. This requires further development of education and enrichment with foreign experiences. The current development of science, technology, production and technology is defining the image of modern society. As a result of the development of innovative technologies, the interest and attention to increase the effectiveness of education using innovative pedagogical and information technologies in the educational process is increasing day by day.

Methods. By the 21st century, which is considered to be the age of information – highly developed technologies, the attention to the issue of wide introduction of innovation in the educational process has been increased. In Uzbekistan, after independence, innovation entered the education system as one of the first compared to other fields, and we can see how innovation is reflected in the educational process in the following.

1. We can see the introduction of innovation into the education system in the example of the adoption of the new version of the Law “On Education”. This serves as the legal basis for the fundamental reform of the education system.

2. We can see the introduction of innovation into the education system in the content of education, teaching methods, lesson form, types of teaching, and teaching tools. These are explained by the introduction of traditional, non-traditional and distance education types of innovation into the content of education; we can see the introduction of active, passive and interactive methods of innovation into teaching methods. If the use of the active method serves to increase the activity of students in the course of the lesson, the passive method is explained by giving students a one-sided understanding. The interactive method means active action together (teacher and student, student and student); we can see the introduction of innovation into the form of lessons in the example of standard, non-standard and virtual lesson forms; innovation in teaching types is explained by problem-based education, heuristic education, graded education, integrated education, interactive education, informal education, formal education, non-formal education; the introduction of innovation into teaching tools in the course of the lesson.

In the application of innovative educational technologies to the educational process organized in educational institutions of pedagogy, the following: orientation of the educational process to the personality of the student, ensuring their perfection as a person, SES (state educational standard) to increase the effectiveness of acquiring knowledge, skills and qualifications; increasing the effectiveness of professional and pedagogical training of pedagogical personnel, especially methodical training, preparation for innovative pedagogical activities; as a result of ensuring the active participation of future teachers in classes based on innovative educational technologies, by turning them into subjects of the educational process, it is necessary to understand the place of innovative technologies in their future pedagogical activities, to use them implementation of didactic goals, such as creating a foundation for the acquisition of methodological knowledge, skills and qualifications, is envisaged.

Results. The application of innovative educational technologies to the educational process sets the following tasks:

1. To study the need to introduce innovative educational technologies in the educational process of educational institutions;
2. To study advanced foreign experiences in modern educational technologies and to choose appropriate technologies;
3. Setting the necessary conditions for applying innovative educational technologies to the educational process;
4. Analysis of the state of application and use of types and forms of innovative educational technologies in the educational process based on the nature of science;

The implementation of the above-mentioned didactic goals creates the need to use innovative educational technologies in the training of future professors, in particular, in the teaching of teaching methodology courses of subjects that create the basis for their methodical training. Elucidation of effective ways of introducing innovative educational technologies into the educational process of an educational institution and development of relevant methodological recommendations is considered one of the main tasks facing professors and teachers, at the same time, the application of innovative educational technologies is interdisciplinary along with the realization of relevance, it complements the educational content in terms of quality, creates an opportunity to organize the methodical training of the future teacher at the level of modern requirements while increasing the effectiveness of the educational process. The use of innovative educational technologies has a positive effect not only for students or professors, but also for management. For example, it encourages the student to work independently and research, realizes initiative; ensures the continuous work of the teacher on himself, renews his activity; and in management, the management of the educational system is facilitated, innovative management and quality are ensured.

An important aspect of the innovative pedagogical education process is the self-management and self-mobilization of the individual, as well as the development of students cognitive activity. This direction includes the activation of the students academic work, determining their professional specialization. Below we present examples of physics and astronomy training sessions in which innovative educational technologies are introduced:

Based on the type and content of the lesson, the appropriateness of choosing innovative educational technologies was noted above. Below we present the “Cubic” method, which is applied step by step to the educational process. The cube method gives good results if it is used during the reinforcement of the lesson.

Discussion. Step 1: After the topic is presented to the students, some understanding of it is formed. It is suggested to write the formed concept as follows.

1. Describe;
2. Compare;
3. Simulate;
4. Analyze;
5. Use;
6. Useful and harmful aspects.

Step 2: For example, after going through Power, if we use the cubic method, students will write as follows.

1. Power;
2. Big, small;
3. Percussion, strong, weak;
4. Physical quantity that gives speed to the body;
5. A physical quantity that changes the direction of movement of a body;
6. The force causes the shape and movement of the body to change;
7. Power is dynamic and static;
8. Body movement is a dynamic manifestation of force;
9. Body deformation is a static manifestation of force;
10. The dynamometer determines the force. It measures the weight of the body. Determines the traction force of the tractor;
11. We cannot walk without the force of friction;
12. Without gravity, we cannot live on the surface of the earth.

Step 3: Events that may occur under the influence of force are given; Many disasters occur as a result of strong winds, strong floods, strong explosions due to volcanoes, earthquakes, strong earthquakes.

In this way, during the learning process, students work independently and think freely, and get a lot of additional information on the topic of "Strength". It is possible to use innovative educational technologies aimed at teaching students to correctly organize the sequence of actions, to think logically, to choose the right one from various ideas and information based on the subject being studied: For example, “Blitz – survey” (quick inquiry) method is also effective in strengthening the topic during the educational process. We use this in the topic “Strength” above: according to this method, questions are asked by the teacher. Answers to the given questions can be returned as a team, group, pair and individually. The teacher gives each student a handout and asks them to study it carefully. Then the teacher explains the content of the handout and the task to be performed, that is, he asks them to enter the sequence of the presented forces into the table based on the sequence of the sections of physics and astronomy.

The introduction of the “Written Debate” method in the evaluation of students knowledge during the educational process will allow students to plan dialogues on topics that stir public opinion together with their peers in

the educational audience. The method is to create conditions for students to deepen their knowledge in the field of the given topic, to teach the culture of debate and to develop the ability to justify their opinion. Using this method, the professor-teacher will have excellent material that will serve as a basis for evaluating students. The method of written debates allows such dialogues to be conducted in written form with the participation of all students in the educational audience. The evaluated student fills in the answer and its proof based on the table.

Conclusion.In the educational system, the correct choice of educational technology by the professor-teacher according to the nature of the subject and the form of the training, its application, each training session is not only an advanced pedagogical and should be based on information technologies, but also enriched with individual technologies. In this way, the knowledge and experience of innovative educational technologies and their application to education ensure that students have knowledge and advanced skills.

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