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USE OF INNOVATIVE TECHNOLOGIES IN THE LESSONS OF PHYSICS AND ASTRONOMY

Abstract: This article discusses the subject of physics and astronomy using innovative technologies

Key words: Physics, astronomy, innovation, computer, power point, presentation, thinking

Innovation in education is understood as the process of improving pedagogical technologies, a set of methods, techniques and teaching aids. Currently, innovative pedagogical activity is one of the essential components of the educational activity of any educational institution. And this is no coincidence. It is innovative activity that determines the direction of professional growth of a teacher, his creative search, really contributes to the personal growth of students. Therefore, innovative activity is inextricably linked with the scientific and methodological activity of teachers and educational research pupils. Of the many pedagogical technologies and innovative techniques, I chose "mine", taking a fresh look at my own work experience. In the system of such training, two types of activity are distinguished - educational and educational.
The first is characterized by direct interaction of students with a computer. The computer determines the task that is presented to the trainees, evaluates the correctness and provides the necessary assistance. Here, training takes place, as a rule, without a teacher. The second type is characterized by the interaction with the computer not of the student, but of the teacher. The computer helps the teacher in the management of the educational process, for example, gives the results of students completing control tasks taking into account the mistakes made and the time spent; data can accumulate, and the computer can compare the performance of different students by solving the same tasks or the performance of one student for a certain period of time. He can also make recommendations on the appropriateness of applying specific learning influences to particular trainees. Usually this type of computer training is used when it is impossible to equip each student with a personal computer, and it acts in the framework of traditional education - as one of the learning tools along with textbooks, software manuals.

In teaching physics, a computer can be used at all stages of a lesson - when explaining new material, fixing, repeating, controlling. The use of computers in physics lessons consists in the fact that students receive information in various forms — text, graphics, and views — in any volume, at any stage of the lesson and in the learning process, which makes it possible to repeatedly submit this information in the form of electronic manuals. Electronic manuals consist of a series of slides that carry certain information. Each slide draws the student’s attention only to the fraction of information that can be increased by overlaying the next slide. As the slides are superimposed, the amount of information gradually increases, which in the student’s brain is reflected as certain visual images. For a more complete effect of achieving the result, the demonstration of electronic manuals must be accompanied by experiments and laboratory work. The use of electronic teaching aids in the educational process helps to make fuller use of all types of memory that can be used to memorize and reproduce material of any kind and complexity.
Let's consider the forms of using information technologies and Internet technologies in the process of studying physics.

1. Dynamic slide lectures. Using the multimedia capabilities of a computer (static image, video, animation, sound) when presenting material. You can use Power Point to create such dynamic demos. A multimedia presentation made in the Microsoft PowerPoint program allows you to combine the visual series with the necessary theoretical information, supplement it with musical fragments, and, if necessary, record the teacher’s explanation.

2. Computer reference books, encyclopedias and dictionaries. The advantage of electronic directories, encyclopedias and dictionaries is a quick search for the necessary information.

I think that any teacher would love to use these tools in their lessons, but for this it is necessary that students have a personal digital assistant (PDA) on each desk, for example, Pocket PC or Palm. Just imagine that in one box weighing a pack of ice cream at the same time are a cultivator, a notebook, a clock, a graphic editor, an organizer, a mass of electronic directories, encyclopedias, and dictionaries. And all this is compatible with a "large" computer, easily replaced, updated, etc. Now imagine. There is a usual physics lesson. “Today we have a test!”, The teacher announces and, instead of writing the text of the assignments on the blackboard, or at best distributing options pre-printed on paper, picks up the CCP. Easy movement with a thin stick-stylus - and now the text appears on the screens of exactly the same boxes lying in front of each student. The teacher can only determine who decides which option, and then in a couple of minutes to collect answers from the whole class. No check of notebooks - the CCP will do everything, including setting grades and preparing a consolidated list of results, where students will be listed at least alphabetically, at least by academic performance, even by eye color.

3. Educational and supervisory programs. A lot of various physics training programs have been released that allow you to study new material, train in solving problems, test your knowledge, etc. Now in education, a popular
knowledge control test system is popular and the computer can fully use the capabilities of this system. But the use of formal computer tests to assess intermediate knowledge cannot adequately reflect students' real knowledge. Adequate assessment of student knowledge based on computer technology is possible only with the use of intelligent information technology expert systems. Such a training system diagnoses errors in the study of a discipline with the help of computers and suggests the right solutions. It should accumulate knowledge about the “student” and its characteristic mistakes, then diagnose weaknesses in the students' knowledge (including analysis of residual knowledge in general education disciplines) and find appropriate means to eliminate them.

4. Modeling of physical phenomena, physical and chemical experiments, which due to reasons cannot be carried out at school. For example, it is impossible to use radioactive materials and potent chemicals in physics classes. Therefore, one of the solutions is to simulate the corresponding experiments on a computer. You can simulate not only experience or phenomenon, but also the universe.

5. The computer can be turned into a powerful measuring laboratory, equipping it with appropriate sensors and peripheral equipment. By itself, this direction is not new and is developing in many countries, but by 2005, National Instruments (USA) became the world leader in this direction. The main principle of its operation consists precisely in the modification of a personal computer to the level of modern measuring instruments with the possibility of recording and documenting the results of observations in the form of graphs, charts, and color displays of indicator intensities. As a result of the ongoing modernization, teachers are given the opportunity to work with a powerful computer device that performs the functions of collecting and digitally representing measured values, a multi-channel oscilloscope, two-coordinate recorder, etc.

6. One of the main technical possibilities of using information technologies in education today is the use of Internet-technologies in training. The global Internet in itself and information technology based on its use are today one of the most affordable means of obtaining information. In fact, it is a global
electronic library that serves educational purposes and contains a wide variety of information. Educational activity in this aspect is connected with the search and obtaining of the necessary information, which necessitates the training of their work with search servers, web portals, thematic resource directories, newsgroups, e-mail and other Internet services.

7. Using a local network in physics lessons. Thus, the current level of development of computer information technologies can significantly increase the comfort of the educational environment and increase the effectiveness of educational services, key indicators of the quality of the educational institution in our time. Obviously, this requires significant efforts of the educational community and serious financial costs. But, if we want to graduate competitive specialists with the potential and motivation to study all our lives, then creating a comfortable educational environment that corresponds to the level of development of information and communication technologies is the only way to satisfy the real requirements of the educational services market and labor resources.

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