USE OF INNOVATIVE DEMONSTRATION UNITS ON IMPROVING THE QUALITY OF EDUCATIONAL PROCESSES

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- Training courses and Flash presentations in the PowerPoint environment (iSpring Pro);
- Development of interactive tests, questionnaires and questionnaires (iSpring QuizMaker);
- Creating interactive elements for increasing the illusory capacity of electronic courses (iSpring Kinetics) [2].

This is a simple and qualitative method of evaluating potential teachers' professional competencies in the learning process. The iSpring QuizMaker software is as follows (Figure 1).

![Picture 1. Window view of iSpring QuizMaker.](image)

iSpring QuizMaker provides users with the opportunity to create quiz quiz and quiz questions, to set up test types and electronically manage them. Volunteer adjusting the display of the asked questions panel allows you to place audio and video files, pictures and formulas in the collection of questions, and automatically calculate students' answers to scores.

**Conclusion**

With iSpring QuizMaker, you can create the following test questions (Figure 2):

1. Верно/неверно. Evaluation of accuracy of the certification.
2. Одиничный выбор. Choose the right answer option (One choice test).
3. Множественный выбор. Multiple answer options (Multiple selective test).
4. Ввод строки. Insert a questionnaire for a specific field (enter a line).
5. Соответствие. Comparison of matching elements (comparison).
6. Порядок. Put the given options in the correct sequence (Sort).
7. Ввод числа. The correct answer variants Enter i in number (enter the number).
8. Пропуски. Please fill in the fields that contain the empty text in the text.
9. Вложеные ответы. From the list, select the correct answer option.
10. Банк слов. Fill in a blank space with the option "bank slov".
11. Активная область. Please specify the correct area in the image [9, 10].

![Figure 2. Test methods in the iSpring QuizMaker window.](image)

You can use iSpring QuizMaker to publish different types of tests and optional subjects. This is one of the ways in which potential teachers will be able to evaluate their professional competence, and test programs will give the student an accurate assessment and an innovative way of control.

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Annotatsiya: Ta’lim samaradorligini oshirishda ko’rgazmalilik ijobiy natijalar beradi. Buning uchun tinglovchilar auditoriyasiga yangi atmosfera va fikrlash muhitini olib kiruvchi innovatsion ko’rgazmali vositalarni qo’llash lozim. Maqolada o’quv jarayonlarida yangi optik qurilmani qo’llash samaradorligi masalasi ko’rib chiqilgan.

Kalit so’zlar: vizualizatsiya, innovatsiya, o’quv jarayoni, optik qurilma, energetik tizim, atom tuzilishi.

Аннотация: При повышении эффективности учебных процессов демонстративность даёт положительные результаты. Для этого необходимо применение инновационных демонстративных средств, которые в аудиторию учащихся приносит новую атмосферу и мышлению. В статье рассматривается вопрос эффективности применения новой оптической установки в учебных процессах.
Ключевые слова: визуализация, инновация, учебный процесс, оптическая установка, энергосистема, атомная структура.

Abstract: While improving the efficiency of educational processes, demonstrativeness gives positive results. This requires the use of innovative demonstrative tools that bring a new atmosphere and thinking to the audience of students. The article deals with the issue of the effectiveness of the use of a new optical device in educational processes.

Keywords: visualization, innovation, educational process, optical device, power system, atomic structure

Introduction

Visualization plays an important role in improving the quality of education and training qualified personal. The importance of visualization in teaching is explained by the fact that emotionally perceived things and phenomena are used to stimulate the educator, to be convinced of the logical and theoretical elements, and finally, to apply theoretical knowledge in practice.

Educational processes based on demonstrative methods as use of posters, the explanation of topics on the board, etc. should not become boring for students.

According to the research, the principles of modular methodology are explained. One of them is the principle of cognitive visualization and its essence is [1]:

Cognitive vision (observable) principle – this principle is based on psychological and pedagogical principles. Training exhibits increase not only the function of questioning, but also the development of cognitive function. That is why cognitive graphics are a new problematic field of artificial intelligence, and complicated objects are described as computer cameras. The module is structured as colored cognitive- graphic teaching elements. Therefore, the pictures are the main element of the module. This is: Firstly, the development of student vision and space thinking; Secondly, the image, which clearly shows the content of the learning material, helps to create systematic knowledge in the student. Thirdly, color
photographs increase the effectiveness of receiving and remembering educational material and serve as a means of aesthetic education of students. The exhibition information is more meaningful and fertile than verbal information. The ability of the viewfinder to transmit data is much higher than the earphones. This, in turn, allows the imaging system to deliver up to 90 percent of the human inputs. In addition, visual information will be provided simultaneously. That's why it takes less time than receiving and remembering the information. When used with illustrative information 27, the impression generated is 5-6 times faster than an oral statement. Trust in human visuals is higher than verbal information. It also does not depend on the length of time between the presentation and remembering of presentation in the visual information. The development of verbal information will depend on this.

As noted in the Decree of the President of the Republic of Uzbekistan “On further development of the higher education system” one of the most important tasks for the further perfection and comprehensive development of the higher education system is the material and technical base of higher education institutions in the educational and scientific-further strengthening of educational and research laboratories with priority instruments in the field of modern equipment and equipment is an important factor in increasing the quality of education [2].

**Research Methodology**

The use of innovative tactics in the lesson will also be effective. At the same time, we try to disclose the meaning of “innovation”. Innovation – any innovation in the education system, its evaluation and use by the pedagogical community.

One of the requirements to the instructor in innovation methods is the recognition and acquisition of teacher's visual teaching methods.

**Analysis and results**

By training on the subject of “Electricity Generation, Transmission and Distribution” in the preparation of technical bachelor's degree in the field of electrical engineering of higher education institutions can be realized by means of demonstrative methods, from the production process to the consumer, from energy
production to consumer. The innovative device shown in Fig. 1 contains the above process and shows the basic building blocks of an electric power system.

Figure 1. Innovative optical device on “Electricity Generation, Transmission and Distribution”(P <10 W).

It is known that the system starts with generation, by which electrical energy is produced in the power plant and then transformed in the power station to high-voltage electrical energy that is more suitable for efficient long-distance transportation. The power plants transform other sources of energy in the process of producing electrical energy. For example, heat, mechanical, hydraulic, chemical, solar, wind, geothermal, nuclear, and other energy sources are used in the production of electrical energy. High-voltage (HV) power lines in the transmission portion of the electric power system efficiently transport electrical energy over long distances to the consumption locations. Finally, substations transform this HV electrical energy into lower-voltage energy that is transmitted over distribution power lines that are more suitable for the distribution of electrical energy to its destination, where it is again transformed for residential, commercial, and industrial consumption.

A full-scale actual interconnected electric power system is much more complex than that shown in Fig. 1; however the basic principles, concepts, theories, and terminologies are all the same [3]. We will start with the basics and add complexity as we progress through the material.

Also, an innovative device can be used effectively in teaching the subject “Electrotechnical Materials” on the subject “Design of the Structure”, “Modern Structure of the Atom” according to the curriculum developed for technical bachelors in the field of electrical engineering. Providing information on the topic can be done as follows.
The modern model of the structure of the atom is based on four positions:

1. At the center of the atom is a positively charged nucleus occupying an insignificant part of the space inside the atom (for example, the radius of the hydrogen atom is 0.046 nm, and the radius of the proton or nucleus of the hydrogen atom is 6.5·10⁻⁷ nm).

2. The positive charge and almost the entire mass of the atom is concentrated in the nucleus of the atom.

3. Atomic nuclei consist of protons and neutrons (common name is nucleons). The number of protons in the nucleus is equal to the ordinal number of the element, and the sum of the numbers of protons \( (p) \) and neutrons \( (n) \) corresponds to its mass number.

4. Electrons rotate around the nucleus in orbitals. The number of electrons in the unexcited (ground) state is equal to the charge of the nucleus (Fig. 2).

![Diagram of atomic structure](image)

**Figure 2. Innovative optical device on “Atom structure”\((P < 8 \text{ W})\).**

Different types of atoms have a common name – nuclides. Nuclides with the same charge, different mass numbers and the number of neutrons in the nucleus are called isotopes. Nuclides with the same mass numbers, but different nuclear charges and the number of neutrons in the nucleus are called isobars. Nuclides with the same number of neutrons, but different charge and mass number is called isotones.

The probability of finding an electron in a certain region of space is described by the square of the wave function \( \Psi_2 \), which characterizes the amplitude of the