THEORETICAL BASIS OF INNOVATIVE TECHNOLOGIES USE IN THE PHYSICS TEACHING PROCESS

Sharipova Shaxnoza
Doctoral student of the Department of Pedagogy, Samarkand State University
e-mail: madatov93@inbox.ru

ABSTRACT

This article discusses physics teaching benefits to students with innovative teaching technologies and interactive methods. The current task is for students to help the younger generation to understand each science development history, the Eastern scientists' contribution to these sciences. Students should not only know our ancestors contribution to the science development (the physics science), but also appreciate it, preserve it and strive to contribute to the science development.

Keywords: Virtual, laboratory work, program, delphi, "Brainstorming", "Critical thinking", "Group working ", "Why" technique, "Cluster" technique

INTRODUCTION, LITERATURE REVIEW AND DISCUSSION

The physics course should provide students with in-depth knowledge which is necessary to study and understand the working principles of various electrical electronic devices. Students should be able to use them in their future work in various sectors of the economy. The physics study is also important for the student's philosophical worldview formation. The whole physics development history is to shed light on the scientific and technological progress dialectic, to reflect the science and technology complex interrelation with socio-economic, historical and environmental problems. Depending on substances structural and electrophysical properties, their use in production is an important and topical issue to create opportunities for deeply study and management of these properties [3.47]. Dedicated to laser radiation effect study on the substances using properties monochromatic radiation using the most widely used electron paramagnetic resonance method of spectroscopic methods, the laser light effect with 0.63 μm wavelength on crystals and changes observed in the substances structural and electrophysical properties with amorphous structural semiconductor properties are studied experimentally, and substances properties change laws under the laser radiation influence on the substances properties are determined. The free radicals formation mechanisms under the various factors influence in some substances and living organisms are also studied.

The current task for students is to help the younger generation to understand each science development history, the Eastern scientists' contribution to these sciences. Students should not only know our ancestors' contribution to the science development (physics science), but also appreciate it, preserve it and strive to contribute to the science development.

The advanced and modern teaching methods use, the new information and pedagogical technologies introduction are important for students to master the "Physics" subject. The subject is taught on the basis of textbooks, teaching aids, lecture courses, handouts, slides, electronic materials, "Brainstorming", "Critical Thinking", "Group working ", "Why" technique. Interactive teaching methods (visual, problem-based, two-way analysis, insert, cluster, "Reading together" technique, "Think-pair-work-exchange" technique are used in lectures, practical and laboratory classes [5.45-46].

Requirements for knowledge, study and students skills in "Physics": a) must have knowledge: - to study theoretical and practical information related to science, to have a clear idea; - to master the science secrets, paying attention to each element; - to know the physics role and importance in a market economy; - have an the factors idea that shape the right motivation to work.

b) need to know: - study the laws of nature and use them for human needs; - create a model of the event; - use of physical methods in the study of physical properties of materials and products;

c) must be done: - develop skills such as the physical equipment use, conducting experiments, processing the data obtained, drawing appropriate conclusions, complete safety; - use laboratory methods in the group materials study; - computer technology use in solving problems;

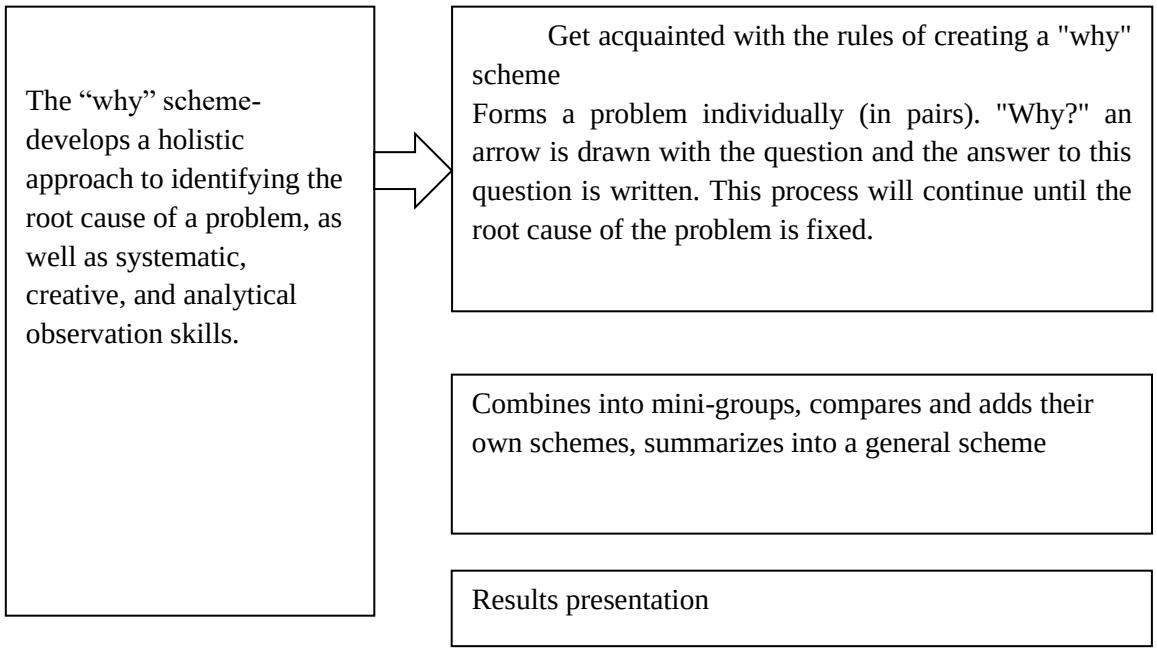
d) must have an idea: - service quality control; - product testing; - the main test conditions - the accurate environment parameters provision; - technology assessment and quality characteristics of finished products; - complex automation; - computer technologies of automation and control; - to raise the quality of services to a new level in improving the living standards of the population.

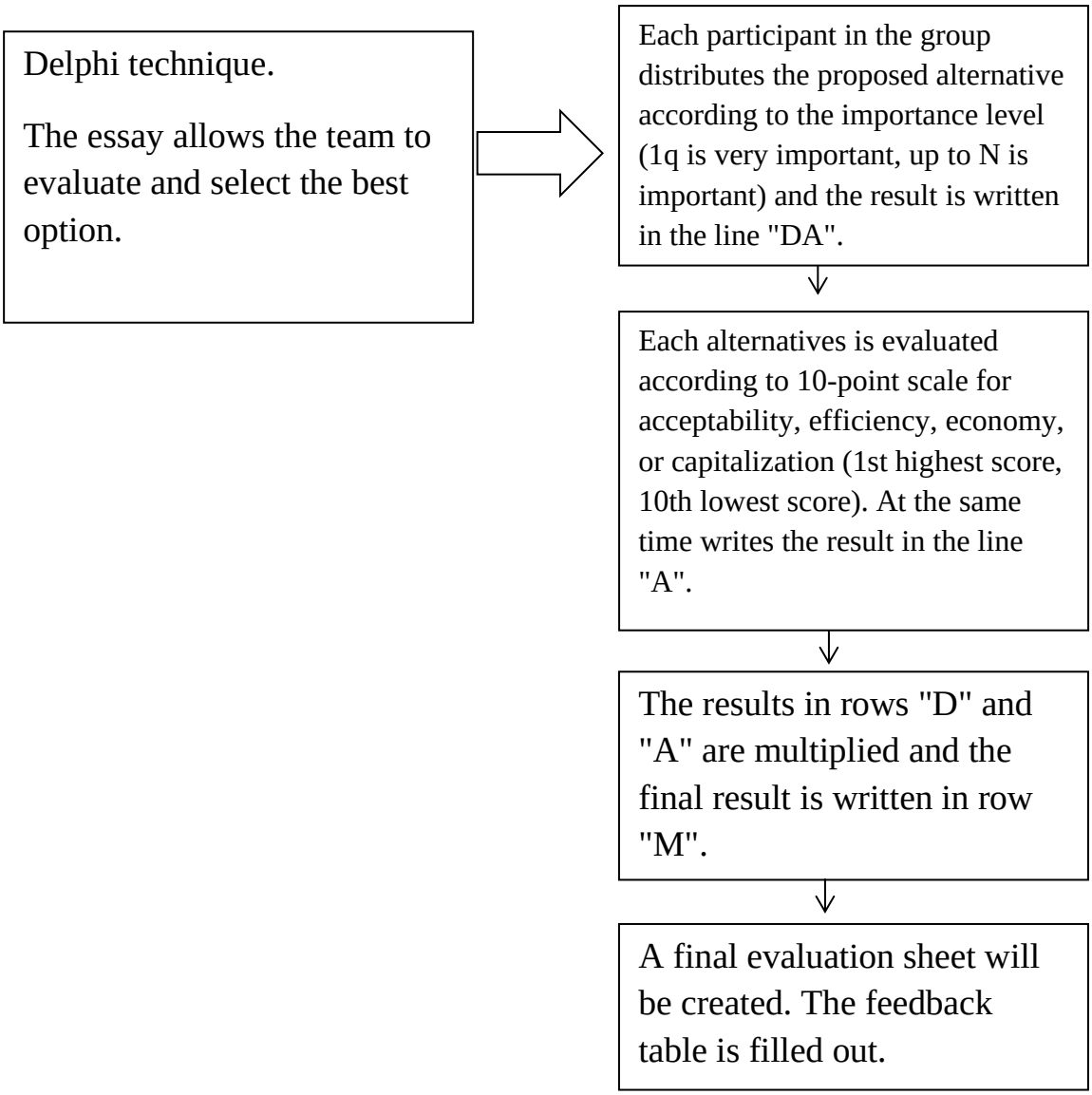
g) ideological and educational task:

- the students' scientific outlook formation of fundamental sciences, the national independence idea inculcation in the minds of young people; - to train students in the interests of the nation: - technical development; - national product increase; - education in the spirit of raising living standards.

Theoretical knowledge acquired during the physics teaching is strengthened through laboratory and practical training. But for the most part, this doesn't work. Such examples of a negative situation are the lack of laboratory stands, modern equipment and devices. This problem can be solved by using virtual laboratories in the classroom [1.38].

Why" technique scheme





Delphi technique
The feedback summary is table

Group	Alternative ideas								
	1st Group			2nd Group			3rd Group		
	D	A	M	D	A	K	D	A	M
Multiplication									

D –evaluation degree
A – alternative assessment
M – multiplication
1 – the highest score
10 – the lowest score

One of the programs that give the user such opportunities is the Electronics Workbench Multisim program. With the program help it is possible to design, model and study analog and digital radio electronic devices of any complexity. However, to get accurate results, the user must have mastered the working rules and techniques with the program and have the skills to apply them to study and research the processes in electronic circuits.

The technologicalization idea of the education system emerged in the 1930s in Western Europe and the United States, when efforts were made to increase the education effectiveness and ensure the individual socialization. This idea is based on the "pedagogical technique" concept introduction (educational technique) in the educational process. In the literature of that time, the "pedagogical (educational) technique" concept was interpreted as "a set of methods and tools that help to organize the learning process clearly and effectively." The teaching and laboratory equipment introduction into the educational process, as well as their effective use, such as explaining the material content with visual aids help, were assessed as leading factors in improving the education effectiveness. By the 1950s, the technical means use in the educational process was recognized as a defining means of "educational technology" direction [2.62-63]. Further improvement of the technical means capabilities is aimed at expanding the information capacity and their transmission quality, the education individualization. The technical means possibilities and their improvement process were accepted as the basis of scientific research in this area. Emphasis was placed on the organizational aspects study of the educational process "technologicalization". By the 1960s, the educational process organization based on the education programming began to be perceived as a factor that reveals the "technology" concept essence. Curriculum means that students are given specific knowledge in a coherent, holistic way, rather than as a separate part. This work was first carried out in the United States. Programmatic education includes learning objectives, appropriate criteria for modifying and evaluating them, and a clear learning environment description. The technologicalization theory formation of the educational process took a long time. In countries such as the United States, the United Kingdom, Japan, and Italy, special attention has been paid to the educational technology study and its problems. Organizations have been set up to study the educational technology problems, and special journals have been published. The task of these organizations and published journals is to summarize and analyze the content and results of research on "educational technology" and to develop specific recommendations on this basis, to promote the most effective research. Today, in independent Uzbekistan, a number of leading organizations are working to introduce new pedagogical technologies in the activities of educational institutions. The scientific seminars and short and long-term courses organized by these centers were attended by pedagogical staff of universities, academic lyceums, vocational colleges and general secondary schools, have theoretical and practical knowledge of pedagogical technology and its use in the educational process. The Higher school problems institute under the Ministry of Higher and Secondary Special Education of the Republic of Uzbekistan, OzPFITI and the Center under the Tashkent state pedagogical university named after Nizami are carrying out a number of positive activities in this area.

The type and appearance of interactive methods are increasing and changing day by day. The ability of a creative teacher to use these methods effectively in the classroom determines the bright future of physics education. The following is an incomplete list of these interactive methods: - "cluster", "mental attack", "intellectual attack", "decision tree", "black box", "scarab", "fish skeleton", "elegant saw", "round snow game", "ice breaker", "lilac flower", "round table", "BxBxB", "Venn diagram", "smart", "zig-zag" strategy, "insert" strategy, "why?", "How?" hierarchical models, etc. [5.124-125].

The introduction of new pedagogical technologies in the educational process is one of the modern requirements, which requires pedagogical staff and teachers to constantly work on themselves. As in other disciplines, the use of new pedagogical technologies in the teaching of physics gives good results. The hours allotted to physics are 68 hours in grades 6-9, and 40 hours per semester in vocational colleges(VC) and academic lyceums (AL) (in the field of social sciences and humanities), with 160 hours for the entire course. During these hours, the teacher should be able to give lectures on the course, as well as problem-solving and laboratory classes. Given the fact that college entrance exam questions require you to solve problems primarily in physics, it becomes clear how important it is to solve problems. Students usually solve a maximum of 8, 10 problems in a traditional two-hour class. In this case, the most active students solve the problem quickly, and other slow-moving students remain "empty" until the problem is solved. Poor learners, on the other hand, are often overlooked by the teacher as a "save" without understanding the nature of the problem. The use of interactive methods - new pedagogical technologies - in such lessons gives significant results. One such method is the 6x6 or 6x5 method. When using this method, the lesson process is as follows:

Step 1. Before the lesson, the teacher places 6 chairs around 5 tables. Step 2. Students are divided into 5 groups by the teacher. The teacher can use the following method to divide students into groups: Place a plate with a picture of a specific object (e.g., rainbow, crystal, car, northern light, and transistor) on each of the 5 tables (Figure 3). The teacher has a total of 30 leaflets with six images of a transistor, a car, a northern light, a crystal and a rainbow, students take turns choosing one of these colored sheets and taking a seat on the table with the picture. Each team chooses a leader.

Figure 1

Using this method, each participant will act as a participant, listener, and speaker for a short period of time. The use of the "6x5" method in the educational process requires a teacher to be very active, to have pedagogical skills. In this case, it is necessary to form teacher groups in such a way that in each group the active and slow learners are properly distributed. When groups are formed incorrectly, students may waste time without solving the problem [3.94-96].

As physics progresses to higher education, the phenomena and laws become more complex, and the volume of course material increases. As physics progresses to higher education, the phenomena and laws become more complex, and the volume of course material increases. In conclusion, the following recommendations were made:

- The purpose of new pedagogical technologies use in physics education is to bring the student to the learning process center, to develop students' independent and creative activity, to make them active participants in the lesson;
- The new pedagogical technologies introduction in physics education as a full-fledged technological process, the educational process technologicalization is a complex process that requires a strong material and technical base of the educational institution, a lot of time and effort. In order to apply new pedagogical technologies in physics education, the teacher must have high pedagogical skills and take into account the subject of the lesson, the number of students, their interests and abilities.

REFERENCES

1. M. M. Khasanov. Modeling of radio circuits and signals in a multisim program environment: A textbook. - Tashkent, Tashkent State Technical University, 2014, 60 pages.
2. T.V. Gordyaskina, S. V. Lebedeva. Radio engineering circuits and signals. Study guide for laboratory work. - N. Novgorod: FGOU HPE "VGAVT", 2010.
3. Abdusalomova M.N., SadinovX.P. A handbook for hands-on activities in Physics. Samarkand, 2009.
4. Abdusalomova M.N. "Physics" lecture course. Samarkand, 2009.
5. Abdusalomova M.N. Technology of teaching physics. A guide. Samarkand, SamISI, 2011 - 186 p.