

## THE USAGE OF INTERACTIVE METHODS AND TECHNOLOGIES IN TEACHING SOIL PHYSICS COURSE

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**Abstract.** *In the educational system, the main goal of using modern technologies for teaching pedagogic classes is to create knowledge, skills, and abilities of students in specialized subjects, to deepen and strengthen their knowledge of these subjects.*

**Keywords:** *student, teacher, qualifications, skills, lecture and practical work, theoretical knowledge, practice.*

It is known that the educational institutions of economically developed countries possess the necessary material and technical bases and regularly work on and improve educational technologies. One of their main principles is the use of various modern pedagogical technologies, which serve as the main criteria for increasing the effectiveness of the educational process.

The use of interactive methods and technologies of teaching in education leads to the achievement of sufficient efficiency in the educational process. When using these methods, it is necessary to choose based on the form, goals and tasks of educational activities. As a result of conducting various methods that activate the participation of students in the lessons, it leads to an increase in their mastery rate.

Modern methods are now widely used in all types of educational institutions. At the same time, there are many types of modern methods, which are sufficient to implement almost all goals and tasks of the educational process. Depending on the type of lessons, it is possible to select the ones that are suitable for specific purposes and use them accordingly. Currently, there are problems of choosing the right specialty to implement these modern pedtechnologies for certain purposes.

For this, it is necessary to plan the lessons in the auditorium, to increase the interest of the students by the teacher and to always encourage their activity in the lessons, to make the educational materials understandable and simple, and to open up their content by brainstorming, working in small groups, problem solving it is necessary to encourage students (pupils) to independently perform theoretical and practical exercises by using situations, debates, guiding texts, projects, various distracting games and similar methods.

Modern methods guide the student (pupil) to solve an activity or problem situations in mutual communication, mutual discussion, thinking, thinking, together. The advantage of these methods is that all kinds of organized activities teach students to think independently, make decisions, and prepare them for an independent life.

When choosing these methods in all forms of education, the purpose of education, the number of learners, their interests and opportunities, the conditions of the material base in the organization of the educational process of the educational institution, the duration of education, the pedagogical knowledge of the student (teacher) , skills, etc. are considered.

When modern pedagogical methods are used, the pedagogue encourages students to actively participate. The student actively participates in the classroom in accordance with the type of lessons. Effective aspects of the student approach are manifested in the following:

- study-learning to improve educational efficiency;
- to encourage learners at the level of opportunity;
- taking into account basic knowledge;
- coordination of the educational process taking into account the goals and interests of students;
- support the activity, initiative and responsibility of students;
- learning by doing in practice;
- creating conditions for mutual feedback between the teacher and the student.

Thus, the use of methods in the process of teaching subjects has its own characteristics. A deeper study and implementation of each method used in educational practice expands the thinking of students and has a positive effect on finding the right solution to problem situations. It increases initiative, creativity and activity of students. When the obtained theoretical and practical knowledge is analyzed through these methods, it leads to an increase and expansion of the knowledge, skills, and abilities of students.

The need to properly analyze and describe the above-mentioned modern education methods will become known. Currently, the most popular educational methods include:

Modern methods: "Case-study" (or "Educational cases"), "Blister survey", "Modeling", "Creative work", "Problem-based education", "Brainstorming", "Boomerang", such as "Gallery", "Zig-zag", "Zinama-zina", "Muzyorar", "Rotastia", "Rounded snow", as well as from the organizers: "Fish skeleton", "BBB", "Conceptual table", "Venn Diagram", "T-Table", "Insert", "Cluster", "Why?", "How?" and others.

Currently, modern educational methods are often used simultaneously with various forms of training technologies. The use of these methods increases the activity of students in training and improves the quality and efficiency of education.

In particular, it gives high results in the teaching of the "Soil Physics" course, which is one of the main departments of soil science. We will get acquainted with the application of some technologies for teaching the topic "Soil structure" related to the course.

**Brainstorming.** The essence of this method is very simple. Students are introduced to a problematic question or issue related to the topic. Specific time is allocated for students to express their ideas and opinions on the issue, for example - 10 minutes. All ideas and opinions expressed within 10 minutes are recorded. As much as possible, all students are given the opportunity to express their opinion. When the time is up, students are given time to read and observe all the ideas written on the screen. Then, with the help of the teacher, all the ideas are divided into groups and they are analyzed and the most suitable option is selected.

**Discussion method** - students are divided into two or more groups and the teacher defines a problem situation. Students determine their directions for solving this problem. Taking into account the nature of the lesson, the teacher can help each group in order to facilitate the solution of this problem. Groups justify and defend their opinion on the solution of the problem. At the end of the debate and discussion, the teacher strengthens the opinion of the groups and together with the students, they come to a conclusion.

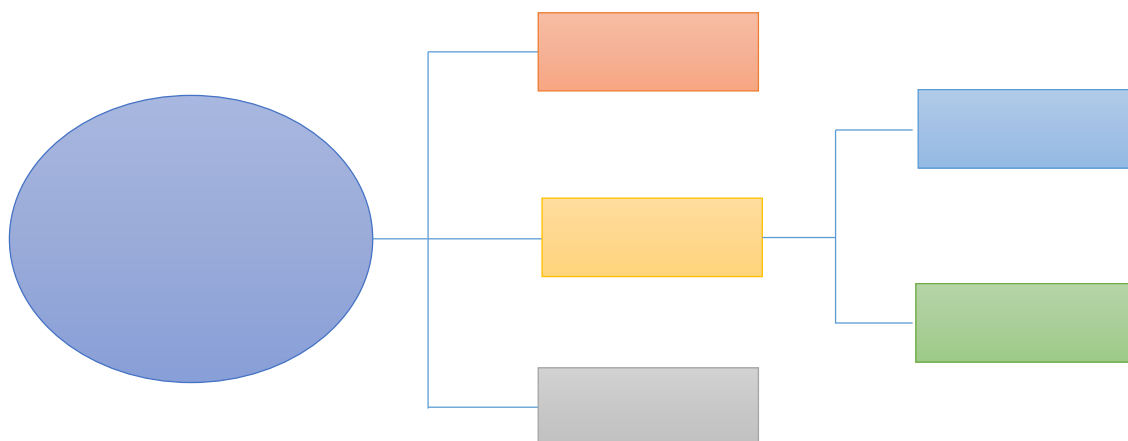
Table Insert. Based on the knowledge gained in lectures and practical training, students compare theoretical and practical information with their initial knowledge, connect with each other, analyze and clarify. Therefore, this method is used after mastering the lessons, that is, after the students acquire knowledge and skills related to the subject. After the teacher explains the topic, at the end of the lesson, students will receive an assignment for independent work at home based on the "Insert" chart. Students work independently and compare the knowledge gained on the basis of this table with life experiences, collect new information, enter them into the table according to the symbols placed in the text.

***Table Insert***

|   |   |   |   |
|---|---|---|---|
| V | + | - | ? |
|   |   |   |   |
|   |   |   |   |

- “V” - ..... corresponds to my knowledge of
- “+” - ..... contrary to my knowledge of
- “-” - ..... new information’s,
- “?” - ..... questions related to theme.

"Cascade" technology. This helps students develop a system of ideas through technology. Its main purpose is to activate and improve the ability to think clearly and creatively. State your thoughts on the question and justify them.



When conducting lectures, especially for young professionals, creating a technological map of training and training and conducting training on this basis leads to high efficiency.

***Teaching technology of lecture training***

|                         |  |
|-------------------------|--|
| Time – 80 min           | Number of students: 25   |
| Form of training        | Visual lecture, two-way analysis   |
| The plan of the lecture | <ol style="list-style-type: none"> <li>1. Soil structure.</li> <li>2. Soil structural</li> <li>3. Formation of structural fragments</li> <li>4. Causes of structural failure</li> <li>5. Ways of formation and restoration of the structure</li> </ol> |

|   |  |
|---|--|
| The purpose of the training session: to study the structural structure of soils, classification of structural parts, the consequences of formation and destruction, as well as ways of restoration, and to create an idea about these in students.  |  |
| <b>Pedagogical tasks:</b><br>1. Creating an understanding of soil structure particles.<br>2. Study of soil structure fragments.<br>3. Evaluation and determination of soil depending on the amount of water-resistant aggregates.<br>4. To study ways of structural damage and restoration and to develop measures for practical application. | <b>Results of educational activities:</b><br><b>Student:</b><br>1. They master the classification of soil structure particles.<br>2. They create an idea about the pieces of the structure.<br>3. Based on the amount of water-resistant aggregates, they form an idea about soil evaluation.<br>4. They learn ways to destroy and restore the soil structure and acquire the skills to apply their knowledge in practice. |
| <b>Teaching methods and technologies</b>  | In this regard, modern "Brainstorming", "Controversy", "Insert table", etc. such pedagogical technologies are used.  |
| <b>Teaching tools</b>   | Text of lectures, visual materials, video lecturer, handouts.  |
| <b>Form of education</b>  | Team, group and individual forms.  |
| <b>Teaching conditions</b>  | Special auditorium equipped with projector, computer technology.   |

***Technological map of the lecture session***

| Stages time                                    | Activity content   |  |
|--|--|--|
|  | Teacher  | Student  |
| Step 1, introduction to training (10 minutes). | 1.1. The lecture informs about its purpose and expected results from the training session.<br>1.2. Using the "Brainstorming" method, tests students' knowledge of a new topic.   | 1.1. He listens and records.<br>1.2. Answers offensive questions asked by the teacher.   |
| Stage 2 (main 55 minutes).                     | 2.1. He divides the students into groups, gives each of them a separate part of the lecture, displays the plan and text of the lecture in the form of individual slides through a video projector.<br>2.2. Each group listens to the answers of the leader and the filler, determines their aspects that need to be filled.<br>2.3. He also listens to the opinions of group leaders and substitutes on the texts of the exchanged lectures. If the aspects that are considered to be initially filled are filled by | 2.1. He works in cooperation with the group on a given topic, expresses his thoughts and comments, complements the thoughts of the leader.<br>2.2. He listens to the analysis of other group students, writes down their shortcomings and refers them to the group.<br>2.3. Participates in the interpretation and explanation of the new text, fills in the |

|                              |  |  |
|------------------------------|--|--|
|                              | subsequent groups, it will be deleted from the place that it specified.  | spaces left by the original group members.   |
| Stage 3. Final (15 minutes). | 3.1. Announces the completion of the lecture part of the lesson and asks the groups to fill in the table "Insert" distributed on the topic.<br>3.2. He receives the completed table from the groups and completes the lecture according to the answers of the students by groups and the organizer's schedule. | 3.1. The organizer fills in the table.<br>3.2. He listens to the supplementary lecture on the topic by the teacher and writes them down. |

Thus, the process of professional education in higher educational institutions is carried out within the framework of a multifaceted integrated system organized in accordance with modern forms and methods of education. In this case, each form fulfills the tasks set for itself, but the set of forms and methods forms a single didactic complex. The implementation of this didactic complex is determined by the psychological and pedagogical laws of the educational process.

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