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INTERACTIVE METHODS AND THEIR IMPACT ON TEACHER LEARNING

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Abstract. This article analyzes the role of interactive teaching methods in the educational process, their positive impact on student learning and their importance in improving educational effectiveness. The theoretical foundations of the methods, practical application experiences and results are discussed. The research examined the integration of modern educational technologies into biological science.
Keywords: interactive methods, educational efficiency, modern pedagogy, biology, educational technologies.

INTRODUCTION

The modern education system requires that students be encouraged to think independently and critically, work in teams and find creative solutions. Interactive methods are important here. Interactive methods that encourage students to be active and increase their motivation help increase the effectiveness of education. This article examines the nature of interactive methods, their impact on student learning, and their practical application.

The main part

Interactive methods are a set of methods that ensure active collaboration between teacher and student and invite students to actively participate in the learning process. These methods are based on student interaction and knowledge creation through discussions (Maslow, 1987).

Types of interactive methods

1. Problem-based education

Problem-based education is a pedagogical method that aims to promote students' independent thinking, critical approach and creative abilities. With this method, the teacher involves the students in solving a specific problem and thus activates the research process within them. Rather than simply memorizing information, problem-based learning encourages students to search for knowledge independently.

The main principles of problem-based education

1. Creating a problem situation: The teacher offers students a difficult but solvable problem. This problem should correspond to the level of knowledge of the students.

2. Active participation: Students are expected to actively participate in problem solving, ask questions and search for answers together.

3. Research-based approach: Students analyze a problem, develop hypotheses and test them.

4. Promote independent thinking: In the process of solving problems, students apply their knowledge and develop new approaches to solutions.

Advantages of problem-based education

1. Develops critical thinking: Students independently apply analysis, synthesis, and evaluation skills to solve problems.

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2. Increases motivation: When solving a problem, students search for knowledge with interest, which forms a positive attitude towards the lesson.

3. Improves teamwork skills: By working in a group, students learn to listen to each other and make decisions together.

4. Increases practical knowledge: Problem-based learning provides the ability to solve life problems and apply theoretical knowledge to real life.

Stages of applying the method of problem-based education

1. Define the problem situation: The teacher offers the students a specific problem that needs to be solved. For example in biology class:

"Why do some animal species adapt to certain environments and others disappear?"

2. Ask questions: Formulate questions that get students thinking.

3. Problem Analysis: Students examine various aspects of the problem and propose solutions.

4. Conclusion: The students find the optimal solution to the problem and confirm their hypothesis.

Application of problem-based learning in biology

- Identification of the topic: For example, in ecology: "What consequences does air pollution have on living organisms?" the question is raised.

- Create projects: Students develop their own suggestions for reducing air pollution.

- Discussion: By analyzing the problem in the group, they exchange ideas and try to find a solution to the problem.

Limits of problem-based education

- Depending on the level of preparation: If the students' previous knowledge is limited, it may be difficult to solve complex problems.

- Takes a lot of time: Problem-based learning takes more time than traditional teaching.

- High level of preparation by the teacher: the teacher must react to problematic situations in advance and guide the students.

Problem-based learning methods develop students' in-depth knowledge and skills and awaken their interest in solving practical problems. By using the problem-oriented learning method in biology lessons, students not only acquire theoretical knowledge, but also develop the ability to apply it in life.

2. Discussion and debate

The discussion and debate method is based on the exchange of ideas and analysis of topics between teacher and students or between students to ensure students' active participation in the learning process. The purpose of this method is to develop the skills of critical thinking and reasoning, expressing one's own opinion and listening to the point of view of others.

A discussion is a process of exchanging opinions and proposing solutions on a specific topic. The aim of the discussion is to analyze the problem and search for an optimal solution through the conflict of ideas.

The main objectives of the discussion and debate method

1. Development of critical thinking: **Students analyze the problem on the topic, provide evidence and justify their opinion.**

2. Development of argumentation and proof skills: **Students learn to present scientific and logical arguments to solve a problem.**

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3. Improving communication skills: **In the process of exchanging ideas, the ability to express one's thoughts clearly and fluently develops.**

4. Teaching collaboration: **Debates and discussions encourage students to make joint decisions.**

Basic principles of the discussion and debate method

1. Encourage students to participate actively: **Every student should participate in expressing their opinions.**

2. Creating a fair communication environment: **Every participant must pay attention to respect and fairness when expressing their opinions.**

3. Scientific justification: **Opinions should be based on evidence and facts.**

4. Mutual respect and listening: **During the discussion, each student is taught to listen and respect others.**

Types of discussion and discussion method

1. Free discussion: **Students freely exchange ideas on the topic and discuss solutions together.**

2. Structured Discussion: **The discussion is divided into specific phases to explore different aspects of the problem.**

3. Debate: **Students express and defend opposing viewpoints.**

4. Socratic Method: **Guides students to logical and deep thinking based on questions and answers.**

Use of Discussion and Debate in Biology

1. Discussion about environmental issues:

- Topic: "What are the consequences of global warming and what measures should be taken to solve this problem?"

- Students discuss the causes and consequences of global warming and offer solutions.

2. The topic of genetic modification:

- Topic: "Are genetically modified foods useful or harmful?"

- Students present scientific findings on this topic and discuss different opinions.

3. Analysis of the laws of natural selection:

- Topic: "What effects does human action have on the process of natural selection?"

- Students analyze human impacts on the environment and discuss ways to reduce them.

Advantages of discussion and debate method

1. Stimulates students' interest in the lesson: The process of exchanging ideas encourages students to actively participate.

2. Develops communication skills: Students learn to express themselves and listen to others.

3. Builds mutual respect: During the discussion, students get used to mutual respect.

4. Helps to put theoretical knowledge into practice: By analyzing problems, students learn more about the topic.

Limitations of the discussion and debate method

- Requires strict control: Lack of control over the process can lead to conflicting ideas.

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- Depends on student preparation: If students are not prepared for the topic, an effective debate or discussion may not occur.

- Takes a lot of time: Discussing wide-ranging topics takes a lot of time.

The method of discussions and debates enlivens the educational process, increases students' interest in the topic and develops their critical thinking skills. The use of this method in complex subjects such as biology helps students understand the problem, express their opinions on current issues, and develop scientific thinking skills. Proper organization of lessons can create mutual respect and cooperation between students.

Literature analysis

Interactive methods are important for active collaboration between teachers and students in education and ensure the active participation of students in the learning process. Among these methods, problem-based learning, role-playing, and discussion and debate are often used to increase the effectiveness of education. Below is an analysis of the scientific research and literature on these methods.

1. Problem-based education

Pedagogical basics. The concept of "problematic education", developed by J. Dewey (1916), is based on the development of students' critical thinking skills during the educational process. According to Dewey, students deal intensively with the topic through problem situations and consolidate their knowledge.

Modern studies. Polya G. (1945) developed a step-by-step solution-oriented approach to the problem-based learning method in the book "The Art of Problem Solving". Polya's research shows that this method can be used effectively in all subjects, from mathematics to biology.

National Scientists H.T. Tokhtayeva (2021) emphasized the importance of problem-based education in developing students' scientific analysis skills in the Uzbek language.

3. Discussion and debate

Scientific foundations. Bloom received a B.S. (1956) emphasizes in his taxonomy of learning objectives that discussion and debate play an important role in the development of students' higher-order thinking skills. In his opinion, this method increases students' ability to analyze, evaluate and create new knowledge.

Pedagogical analyses. Robin A. (2004) showed how important dialogic teaching and discussions are for students' mastery of the subject. By encouraging students to ask each other questions and evaluate their answers, Robin ensures that students delve deeper into the topic.

National studies. Uzbek scientists S. Karimov and R. Sodikova (2021) worked to revitalize biology education by engaging students in dialogue. Her research shows that discussing topics such as environmental issues or bioethics sparks a deep interest in the topic.

The analysis of the literature shows that problem-based learning, role-playing, and discussion and debate methods activate the students' learning process. Through these methods, students strengthen theoretical knowledge, develop practical skills and develop critical thinking skills. The use of these methods in biology is important for understanding the subject and developing life skills.

CONCLUSION

Interactive methods activate the educational process, play an important role in deepening students' knowledge and forming their practical skills. In particular, problem-based learning

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and discussion and debate methods increase students' ability to think independently and increase the level of knowledge analysis, knowledge understanding and knowledge application.

Problem-Based Learning Method: In this method, students are presented with a specific problem or situation and are instructed to find ways to solve it. Problem-based learning promotes students' critical thinking, logical reasoning and creative approach. The students take an active part in finding a solution to the problem themselves and thus strengthen their knowledge. Students also develop a sense of research, research and responsibility.

Discussion and discussion method: Through this method, students have the opportunity to express their opinion on the topic and listen to the opinions of others. Through debates, students develop the ability to justify, prove and communicate their points of view with others. This process strengthens the students' speaking skills, communication culture and teamwork skills. Through discussion, knowledge becomes deeper and more understandable and students understand the topic more deeply.In general, interactive methods transform students from passive listeners into active participants, making the educational process interesting and effective. Problem-based learning and discussion methods significantly increase the efficiency of learning by promoting students' critical thinking, communication and creative approach.

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