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Application of Bloom's Taxonomy as a Tool for Increasing the Efficiency of Learning

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ABSTRACT: The relevance of the research topic is substantiated by its scientific, practical and theoretical significance. The problem of setting educational goals and objectives is being actively developed today and is appropriate for the entire pedagogical and methodological science as a whole. The article also gives a detailed definition of the concept of taxonomy, as well as the essence and content of the application of B. Bloom's taxonomy.

KEYWORD: learning, taxonomy, Benjamin Bloom, knowledge understanding, application, analysis, synthesis, evaluation.

Today, in modern education, there is an acute issue not only of teaching schoolchildren, but also of educating the personality of a future graduate: proactive, active and motivated for success and a career in the future. To do this, the teacher should not give the student completely ready-made information. The student needs to be introduced to the methods of obtaining information that would require him to select it, to comprehend it, so that in the future the student can apply the knowledge gained in life, profession, etc.

In this regard, the teacher should build the educational process in the classroom in such a way that students who accumulate new knowledge develop skills, the ability to demonstrate their knowledge on the topic, the ability to express their thoughts, ideas, and question certain assumptions. The teacher must understand how to organize the activities of students in the classroom to improve their understanding and awareness of what and why they are doing. Schoolchildren should be able to think, analyze the level of their achievements in learning, and be responsible for their own education. They should be able to talk about what they have learned, be able to connect new knowledge with past experience and apply it in everyday life.

What should be the methods and techniques of educational and educational activities? Benjamin Bloom, a psychologist at the University of Chicago, thought about this in the 1950s. He believed that if there were no special methods and techniques for training and education, then it is unlikely that people could reach those heights, having conquered which they became famous.

Benjamin Bloom's research led him to create a model of educational and educational techniques, thanks to which talents were developed in people who later became outstanding. This model was called Benjamin Bloom's Taxonomy of Levels of Cognition and was later proposed by a group of American scientists led by B. Bloom for use in pedagogical practice.

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Bloom's taxonomy presents a classification of the tasks and corresponding learning objectives that the teacher sets for the students. All of them are divided into three areas: cognitive, affective (emotional) and psychomotor (in other words: "I know - I feel - I create"). Within each sphere, the transition to a higher level is impossible without comprehending the experience in the previous ones [2; 482].

Cognitive area - here the skills associated with knowledge, understanding and critical thinking are formed.

Affective area - skills that reflect the emotional sphere of a person, his relationship with others, feelings (empathy, joy for his neighbor, etc.).

The psychomotor area is associated with practical skills, with their development (the ability to use tools, devices).

The goal of Bloom's taxonomy is the most complete form of student learning that can be achieved if the teacher focuses on all three areas.

Bloom's Pyramid is a hierarchically interconnected system of educational goals. Each of its levels involves the formation of certain thinking skills (from simple to complex) (see Figure 1).

B. Bloom identifies 6 main sections: knowledge, understanding, application, analysis, synthesis and evaluation. The task of the teacher is to plan the lessons in such a way as to encourage all types of students' intellect to work on each of them [4; 32].

Rice. 1 Bloom's Pyramid

Consider the meaning of each target category aimed at specific actions of students in the lesson.

The lowest level of thinking according to Bloom is knowledge and understanding. At this level, students memorize and reproduce the studied material. This level is considered achieved if the student reproduces terms, specific facts, basic concepts, principles, etc. [4; 20].

At the level of understanding, the student's ability to transform material from one form of expression to another, understanding the internal content of the topic under study, the ability to predict the further course of events or phenomena is assumed. The level is reached by the student if he is able to explain the facts, rules, principles, is able to transform what he says into words into formulas, can assume the consequences, for example, from what he saw during the experiment, etc.

Intermediate, middle level, occupied application and analysis. The specific actions of students at this level are the ability to apply laws, theories, use concepts and principles in new situations.

At the level of analysis, the student must be able to break the whole into parts, establish relationships between parts, determine the principles by which the whole is organized, build a logical chain of reasoning, find errors and omissions in the logic of reasoning, and see the differences between facts and consequences.

The high level of thinking includes synthesis and evaluation.

Synthesis involves the ability of students to create a whole by combining elements. To do this, the student must be able to draw up a plan of his actions (for conducting an experiment or writing a report, abstract, etc.), a scheme of the task.

At the highest level – the level of assessment – the student must be able to assess the significance of a particular material in a particular situation, the significance of a particular product of activity.

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When planning a lesson, the teacher will be assisted by the verbs that support Bloom's taxonomy [1]. When constructing assignments for the lesson, you can use the Ilyushin L.S. task constructor. Table columns L.S. Ilyushin are composed using Bloom's verbs (see Table 1).

Level

Action verbs

Sample questions

Sample tasks

Knowledge

Select, find, list, recall, name, define

What? Where? When? Who? How did it happen? How can you show? Which?

Search, compile, fix errors, run a test

Understanding

Express, distribute, compare, classify, generalize, discuss, explain

How to distribute? How about to compare?

What's happening? What does it mean? What can be said about…? How to generalize?

Prepare drawings, diagrams, illustrations, reports, messages

Application

Apply, calculate, modify, complete, classify, investigate, experiment, decide

How to solve using…? What to change to…? How to present? What will change if…? What elements to choose to change…? What facts to select to show…?

Conduct a survey, conduct an experiment, make a table, reflect in the figures

Analysis

Deduce, single out, explain, oppose, disassemble, compare, arrange

What are the ingredients…? How are they related…? What are the reasons? What can be assumed? What conclusion can be drawn? What evidence can be given?

Build diagrams, graphs, diagrams, review, prepare an essay, presentation

Synthesis

Compose, create, develop, generalize, combine, propose, establish, replace

What changes should be made to…? What happens if…? What can you suggest…? How to pply… to create…? What to do to reduce (increase)? How to check?

Prepare a presentation, diagram, algorithm; write a story, design a device

Grade

Defend, measure, test, substantiate, challenge, confirm, test

Do you agree with the actions (results)? What is your opinion? How to prove (disprove)? How can you evaluate (place)? What are the benefits…?

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Write a review, express an opinion, prepare recommendations, make a review, put forward a hypothesis, prepare a story (report, report, report)

Table 1. Action verbs of Bloom's taxonomy

Also in the lessons you can use the Bloom cube [5]. "Why?", "Explain", "suggest", "name", "think up" and other words can be written on the edges of a cube made by a teacher or students. When tossed on its edge, a specific task falls out that the student must complete. The simplest task may be to reproduce the formulation of some law, definition of a concept or rule, that is, at the level of reproduction. The word "name" prompts the student to these actions. But if the word "why?" fell out on the cube, then here the student must establish the causes and consequences of the phenomenon, the process that can occur with some object. The task «explain» requires the student not only knowledge, but also the ability to apply them in a specific practical situation. "Suggest…", "Think up…", "Share…" are aimed at activating the mental activity of a student who is capable of establishing differences between facts and consequences, of analyzing, assessing the significance of data, using knowledge from other subject areas, etc. That is, here we are talking about the students' understanding of the internal, more detailed content of the material.

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