

# Using the taxonomy of Blum in Discrete math and logic math lessons

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**Annotation:** In the article considered making of irregular tests.

**Key words and word expressions:** negation, conjunction, disjunction, implication

Improving the efficiency of education, ensuring the quality of implementation of state educational standards is one of the important tasks of pedagogy today. The teacher is looking for ways, methods and techniques, different means and situations of teaching that are convenient for all, that activate students in the acquisition of knowledge. Using them increases the effectiveness of the pedagogical process. It teaches students to think independently, directs them to creative pursuits, and learns the secrets of their future careers. We believe that the implementation of these goals can achieve the desired result through a creative approach to the educational process, the effective use of new innovative technologies.

The content plays a key role in the development of test items, so it is advisable to create test items that define the knowledge in the content of the course and determine the level of achievement of appropriate learning objectives.

Professors should define learning objectives based on Blum's taxonomy based on the content of the topic being studied and organize lessons based on that. Defining learning objectives in accordance with the didactic goals of the lesson prepares the ground for determining the effectiveness of education and eliminating shortcomings.

The taxonomy of learning objectives was developed by Benjamin Blum and includes knowledge, understanding, practice, analysis, synthesis, and evaluation.

It is advisable to determine the degree to which students have mastered the knowledge and information on a particular topic by monitoring their knowledge of the Blum taxonomy to ensure that they have achieved the learning objective. To do this, the student must identify objects on the topic, describe them, process the data, express their opinion, explain the essence of a particular process, object or event, highlight the specific features of the process, object or event.

These considerations cannot be implemented with a standard learning and multiple choices, it is recommended to use some non-standard tests with multiple responses in determining the level of achievement of the learning objective.

These test tasks allow students to monitor and evaluate not only the knowledge they have acquired, but also their ability to recognize the object and its parts, to identify their specific features, and to conduct a fair and equitable process.

Test control:

1. What is the denial of comment A?  
a) not b) and c) or d) in that case
2. What is the conjunction of feedback A and B?  
a) then b) or c) and d) not
3. What sign defines the disjunction of feedback A and B?  
a)  $\wedge$  b)  $\vee$  c)  $\rightarrow$  d)  $\bar{\quad}$
4. What is the implication of feedback A and B?  
a) not b) and c) or d) in that case

Understanding plays an important role in learning objectives. In order for students to achieve this learning goal, they will need to find solutions to the problems being studied on the topic, understand their importance, and highlight the main idea.

Determining, monitoring, and evaluating students' achievement of this learning objective requires them to summarize the ideas in the learning material, process the main idea, give examples, express their opinions, and defend it. As noted above, these levels cannot be determined using standard learning and test tasks, it is recommended that they be determined only using multi-answer non-standard test tasks.

Test control:

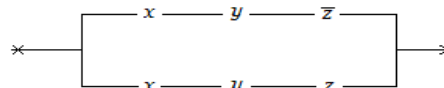
- How many true values does the formula  $(A \wedge B) \vee C$  have?  
 a) 3 b) 2 c) 4 d) 5
- How many false values does the formula  $(A \rightarrow B) \vee C$  have?  
 a) 1 b) 2 c) 4 d) 3

The unity of theory and practice plays an important role in the principles of organization of the educational process, taking into account the need to create opportunities for students to apply the acquired theoretical knowledge in practice. To do this, the teacher must take into account that the students will apply the acquired theoretical knowledge in a new unexpected situation when creating learning tasks. In the process of completing these tasks, students are required to rework, adapt, design, model, and retell the learning material.

Applying the theoretical knowledge acquired by students in practice does not give the intended result of determining the level of achievement of learning objectives through standard teaching and test assignments. Therefore, it is recommended that you use the multi-answer non-standard test assignments provided below.

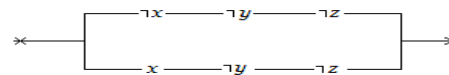
Test control:

1.



- a)  $(x \wedge y \wedge \neg z) \vee (x \wedge y \wedge z)$  b)  $(x \wedge y \wedge \neg z) \rightarrow (x \wedge y \wedge z)$  c)  $(x \vee y \wedge \neg z) \vee (x \wedge y \wedge z)$  d)  $(x \wedge y \wedge \neg z) \vee (x \wedge y \vee z)$

2.



- a)  $(x \wedge y \wedge \neg z) \vee (\neg x \wedge y \wedge z)$  b)  $(\neg x \wedge \neg y \wedge \neg z) \rightarrow (x \wedge y \wedge z)$  c)  $(x \vee y \wedge \neg z) \vee (x \wedge y \wedge z)$   
 d)  $(\neg x \wedge \neg y \wedge \neg z) \vee (x \wedge \neg y \vee \neg z)$

Analysis plays an important role in the acquisition of knowledge, in order to achieve the learning objectives of the analysis, students need to divide the information or object into parts, compare, divide into parts, identify and compare their specific features. It is recommended that the following multi-answer non-standard tests be used to determine, monitor, and evaluate the level of achievement of this learning objective.

Write the omitted words.

1) The number of propositional actions involved in a logical formula is called \_\_\_\_\_.

2) If the formula  $U(x_1, x_2, \dots, x_n)$  assumes only a value of 1 (if the last column elements in the table are only 1), such a formula is called \_\_\_\_\_.

Synthesis of knowledge plays an important role in learning objectives. The main purpose of synthesis learning is the integration of the main ideas of the course or topic by students, grouping or generalization, reconstruction according to the specific characteristics of processes and objects. It is not possible to monitor and evaluate these mental operations that must be performed by students through standard learning and test assignments.

Define the following sequence of actions to bring an arbitrary formula to a normal form and an improved form:

1. If the action  $\neg$  belongs to a formula, it is necessary to write the action  $\neg$  with respect to the variable feedback using the De Morgan relationship.

2. If the operations  $\wedge$  and  $\vee$  in the formula are repeated for a single consideration or its negation, it should be simplified using equivalent formulas.

3. If the operations  $\rightarrow$  and  $\leftrightarrow$  are involved in the formula, they should be converted to  $\{\neg, \vee\}$  and  $\{\neg, \wedge, \vee\}$  using equivalent formulas [3].

Drawing conclusions within the learning objectives is the final and systematic task. Summarizing The essence of the learning objective is to draw conclusions about the course or topic studied by the students. In this process, students are required to evaluate the information in the educational content, express critical opinions, support or deny using critical thinking skills.

Put “yes” if any of the following statements are true and “no” if they are incorrect.

1.  $\neg$  is the complement of a set in the algebra of negative action sets.

2.  $\wedge$  is the intersection of conjunction action sets.

3.  $\vee$  is the sum of the disjunction operation sets

4. «0» -  $\emptyset$  - empty set.

5. The disjunction function of algebra of considerations corresponds to the principle of series connection in engineering.

6. The conjunction operation of algebra of considerations corresponds to the principle of parallel connection in engineering.

#### References:

1. Tolipova J.O. Pedagogical qualimetry. Tashkent, 2016.
2. To'raev H. Mathematical logic and discrete mathematics. Tashkent, Teacher, 2003.
3. Yusupova A.K., Gafforov R.A. The role of student attentiveness in the classroom of probability theory and mathematical statistics in higher education. Asian Journal of Research in Social Sciences and Humanities. Vol. 11, Issue 11, November 2021
4. Ne'matov I. Elements of discrete mathematics and mathematical logic. Fragona, 2011.