

METHODOLOGY FOR CONTROL OF KNOWLEDGE, SKILLS AND COMPETENCIES OF STUDENTS FROM MATH

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Abstract

This article provides an example of the methodology for conducting current, intermediate and final types of control of the effective control of knowledge and practical skills of students in practical classes from math.

Keywords: Education, quality, monitoring, efficiency, control, access control, current control, final control, knowledge, skills, qualifications, quality control of knowledge, result, institution.

Introduction

Nowadays we know that the quality of education is a social concept that determines the state and productivity of the educational process in society, the suitability of an individual for the needs of society in the formation and development of civil, daily and professional competencies. One method of quality control of education is - pedagogical monitoring [1]. Monitoring (monitoring - control implementation, check) - a set of diagnostics, analytical assessment and predictability of changes in the state of the integrated system.

There are 3 levels of educational monitoring:

1. In personnel qualification institutions
2. Among the institutions of Higher education (accreditation)
3. In the higher educational institutions among itself (internal attestation).

The main objectives of monitoring:

- determination of pedagogical efficiency and social results not only at the stage of implementation, but also in the dissemination of results;
- the collection of information on developed pedagogical experiences corresponding to the development strategies of education [2].

Monitoring is a comparison of concepts that must be with the notion that there is a constant, that is, it consists of observation in the objective of control.

The relative analysis of monitoring in Institutions of higher military educations is as follows:

- current control results;
- intermediate control results;
- semester final results;
- final control results.



Monitoring results of:

- each student;
- each group (subgroup);
- discipline;
- improved by academic year, comparing with previous years.

In higher education, it is proposed to start the assessment process from introductory diagnostics [3]. This process is also observed in Institutions of higher military education. When conducting such initial diagnostics, the partial or total absence of special knowledge, skills and qualifications in the student means that there is no basis for making any strict decisions, but the need to work individually with exactly this student.

Access control (or entrance control) is carried out at the beginning of September (the time of the beginning of classes prescribed for the academic year in science), which allows you to determine the necessary level of active knowledge in order to continue education, and in the future to draw up a strategy for the development of this knowledge, as well as, if necessary, to organize the results of the access control are of course or marked on an electronic journal or diary (personal plan). This helps to compare with the result that will be achieved later, to strengthen the motives of the student (Table 1) [5].

Table 1

Solve these problems:

1. $\frac{0,125:0,25+1\frac{9}{16}:2,5}{(10-22:2,3)\cdot 0,46+1,6} + \left(\frac{17}{20} + 1,9\right) \cdot 0,5$
2. Solve this equation: $|-x + 2| = 2x + 1$.
3. Find rational roots: $2x^3 + 5x^2 + 4x - 12 = 0$.
4. Solve this equation: $\text{ctgt} - \text{sint} = 2\sin^2 \frac{t}{2}$
5. $\frac{z+4}{z-1} + \frac{z-4}{z+1} = \frac{z+8}{z-2} + \frac{z-8}{z+2} + 6$

In the above example was brought to the entrance control, where students were held to determine fundamental levels of knowledge. These examples can be constructed in 2 and more variants. Basically, access control will be possible in individual work, in pairs and in collective forms.

Current control. This type of control is carried out with the aim of filling the level of appropriation and gaps of the proposed material. Traditionally, this type of control is carried out at each session (Table 2) [5]. The main goal is to analyze how the formation of skills and abilities of Students is going. It is also used to determine the degree of appropriation of a large subject of software material.



Table 2

Non-standard test	
1. $\int \frac{dx}{\sqrt{x^2+1}}$	A. $tgx + C$
2. $\int \frac{dx}{a^2+x^2}$	B. $-ctg \frac{x}{2} + C$
3. $\int \frac{dx}{\cos^2 x}$	C. $\frac{1}{4} [(x+3) - (x-1)]$
4. $\int \frac{dx}{1-\cos x}$	D. $\ln x + \sqrt{x^2 \pm 1} + C$
5. 1	E. $\frac{1}{a} \arctg \frac{x}{a} + C, (a \neq 0)$

In the daily practical exercise on the topic of indeterminate integral in the above example, we can see that students are one share of the table score in determining the knowledge, skill and competencies [5]. This non-standard test method can be applied at the entrance to the training. The final control is large enough for the purpose of evaluating educational outcomes in the specific study time range, such as trimester, semi-annual, annual, etc. it is conducted to determine the degree of attainment of the objectives of the results training conducted at the time.

These control types are available in standard and non-standard forms.

To the standard: oral survey, written survey, independent control works that, after mastering specific topics, form independent control and independent assessment skills in students; independent works showing that they are able to practice their acquired knowledge on a specific topic; graphic works: drawing, diagram, schemes, drawings, etc.; scheduled control work; a set of supervisory work (trimester, semi-annual, annual) that verifies the knowledge, skill and competencies on specific sections or topics of the program (Table 3) [6].

Table 3

Variant №1	
1.	Problems leading to the concept of a definite integral. A definite integral - defined as the limit of the integral sum.
2.	$y = \ln \operatorname{ctg} 4x, y' = ?$
3.	$\lim_{x \rightarrow 2} \frac{x^3 - 8}{x^4 - 16}$

Non-standard: creative work, project protection, competencies [4].



In diagnostics, a significant place is occupied not by reproductive tasks (information processing), but by productive tasks (issues) related to the implementation of knowledge and skills.

The main content of the assessment of results in science is built on the basis of educational skills [3,7].

When conducting monitoring, the teacher takes an individual approach to students. That is, in this, the teacher focuses his entire movement on the development of the individual abilities of the student, his inner capabilities, on the formation of the ability to find the optimal solution in him in various life situations. In this case it is significant to look through characteristics of every student and find out methods to stimulate and motivate their interests to math.

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