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**CLASSIFICATION OF EDUCATIONAL AND COGNITIVE TASKS
IN THE MILITARY HIGHER EDUCATION INSTITUTION**

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Abstract

Monitoring is one of the lecturer’s activity aspects which let to evaluate effectiveness of training and results of higher education in the form of competences. Various types of tasks to identify students’ level of training at the stage of thematic, on-going, midterm and formative assessment have been developed and presented in the Russian and foreign science. The requirements of the Federal State Educational Standards (FSSES) to effective training in the system of Russian military education indicate competences, which can be regarded as the request for future military officers with comprehensive knowledge and analytical thinking. The authors propose the classification of educational and cognitive tasks (ECT), the parameters of which allow lecturers to compile them for developing and assessing military students skills and abilities, and of the generalised indicators of the methodological and didactic systems of educational and cognitive tasks. The typology of educational and cognitive tasks is built with regard to the methods of theoretical and methodological analysis, classification, and modelling. All types of educational and cognitive tasks used to monitor academic progress of military students can give a general impression of how students embrace and master the studied disciplines. The examples of educational and cognitive tasks used in the humanities cycle of educational disciplines are given.

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1. Introduction

Higher military professional school as the building block of the Russian education has long traditions, including those related to the design of teaching and learning process. The list of professional duties of academic staff includes supervision and evaluation procedures for assessing the level of studying the educational materials (results of higher education in the form of competences). The structure of such procedures comprises oral, written and programmed control. Monitoring is exercised with the help of various questions, tasks, exercises, etc.

Different types and forms of tasks have been accumulated in the learning process. The typology of tasks has been set by many authors (Avanesov, 1978; Bloom & Hastings, 1971). Similar research works have been widely conducted in the former USSR and modern Russia (Romanov, 2018).

For example, type test tasks (TT) has been tested in the Russian education. The system of TT was adopted as the guideline. In the military education, the demand for test tasks rests on the compulsory and absolute on-going assessment: each military student should have at least one mark after a seminar or laboratory class. Tests allow lecturers to cover all students. But there is still a priority that is to train military specialists who are able to think and make decisions (Gaidamashko, Gojkov & Karayani, 2017; Karayani, Gojkov & Syromyatnikov, 2015; Ponomariova, Vasina, & Smyshlyaev, 2017).

Using various disciplines as an example, Russian scientists have revealed the leading role of questions that develop and encourage students thinking. In this regard, educational and cognitive tasks are used, whether in the mode of individual or group work (Klarin, 2016; Ponomariova & Vasina, 2016; Serykh, Grudtsina, Votinov, Abramova, Gaidamashko, & Morkovkin, 2018; Romanov, 2018).

2. Problem Statement

The concept “structure content of education” (as a reflection of social experience accumulated by mankind in a specific area – mathematical, military, environmental, etc.) includes four components:

- experience of cognitive activity (systemic knowledge);
- practical experience (skills and abilities);
- experience in creative activity;
- experience of emotions- and values-based attitude. Klarin called this theory the “Newtonian” for its fundamental character (Klarin, 2014).

The concept “pre-disciplinary content of education” indicates that the content of education should be designed before defining the list of disciplines and content of educational materials in them (Kraevskij & Khutorskoi, 2011). It means that the pre-disciplinary content is a model of content specified at the following levels: a) curriculum; b) academic discipline; c) educational material. All the above-mentioned elements of social experience should be presented in the pre-disciplinary content of education, including:

- systematic knowledge about the world, society and human;
- practical experience (according to studied professional context);
- experience in creative activity;
- experience of emotions- and values-based attitude to the world;
- personal experience of lecturers, students (alongside with national and regional component).

The problem is as follows: all types of tasks used to monitor academic progress of military students can give a general impression of how students embrace and master the studied disciplines.

However, the laws and logic of assimilating four mentioned components in the content of education have not been sufficiently developed, although an enormous number of tasks have been created. Therefore, the drafters indicate challenges in formulating assignments within a particular topic, a specific academic discipline, and teaching and learning process as a whole.

In the military higher education institution the fund of assessment means should contain tasks that ensure the better response to the requirements of the Federal State Educational Standards (FSES) for the results of studying educational programmes and acquiring professional competences focused on the development of analytical and critical thinking among future military officers (Karayani, Syromyatnikov, & Gojkov, 2015; Klarin, 2016). From these positions, educational and cognitive tasks (ECT), as professionally oriented educational material that generates military students motivation and thinking, are particularly valuable in the military education (Ponomariova, Vasina, & Smyshlyaev, 2017).

It is important to highlight the parameters (indicators) of educational and cognitive tasks, which should be taken into account when forming a set of assessment means, so that the multicomponent content of education is encapsulated. Lecturers should be aware of tasks essence in order to plan educational, cognitive and emotional activities (for example, through broadening positive experience of emotions- and values-based attitude to the Motherland, the chosen profession; patriotic, inter-ethnic education, etc.). Therefore, ECTs should be classified according to the groups of characteristic features.

3. Research Questions

Classification as means of learning enables to divide the studied object into classes (didactic and methodological system of ECTs) and categories (properties / parameters of ECTs). As the classified feature can be chosen any one, both essential and non-essential.

Classification allows defining the proper academic workload for the specific group of students.

In the analysis of tasks, two types are usually distinguished:

- 1) tasks indirectly presented in the form of a text, but nature of activity is not specified (see below ECT No. 1);
- 2) explicitly presented tasks, but nature of activity is indicated (see below ECT No. 2).

Normally, the first type of educational and cognitive tasks is more complicated.

4. Purpose of the Study

The goal of research is to classify educational and cognitive tasks (ECT) as the component of pre-disciplinary content of military education on the basis of didactic and methodological analysis. This is about the typology of ECTs regardless of the discipline studied in the military higher education institution, when lecturers knowingly select the appropriate set of tasks for assessing competences that are being formed.

5. Research Methods

The work is based on studying, analysing and summarising psychological and pedagogical materials, regulations, and teaching experience (Garvin, 2000; Kennedy & Neilson, 2002; Wolfe &

Steinberg, 2014). The systemic activity- and competence-based approaches are the leading methods of addressing the problem under consideration. The typology of educational and cognitive tasks is built with regard to the methods of theoretical and methodological analysis, classification, and modelling. The major terms used in the research work include:

- pre-disciplinary content of education”;
- four-component content of education”;
- educational and cognitive tasks”.

6. Findings

In the theoretical sense, the *didactic system* of ECTs *reflects the essence of tasks. It is governed by:*

- the content of education (mathematical, environmental, military, etc.);
- the process (learning model, i.e. forms, methods, techniques, means);
- the supervision (management) of how military students acquire knowledge within the studied disciplines.

We focus our attention on the fact that in the didactic system, recording of all ECTs indicators (parameters) is required for the stimulation of teaching and learning process. It is necessary to oversee training of students within academic courses or disciplines.

The invariant properties of educational and cognitive tasks include:

- availability (expected availability) of source data;
- indicated activities and their results;
- available object of activity;
- direct or indirect inclusion of objective actions having specific features;
- interdependence and mutual interference in teaching and learning process (including feedback);
- measure of complexity or difficulty (differentiating fineness);
- apparent or hidden availability of means and essence of assimilation.

Familiarity with these properties guides the drafters of tasks (including lecturers who design their academic disciplines) to their *conscious* use for identifying a particular aspect of learning.

The variable properties of educational and cognitive tasks are as follows:

- courses and disciplines presented in the content (academic courses or disciplines, which can be field-specific, field-integrated, cross-disciplinary, extra-disciplinary);
- amount of information (sufficient, inadequate and excessive information can imply different types of educational activity during completing ECTs);
- paradigm (nature) of the situation of using knowledge within academic disciplines;
- reproductive performance (fulfilment according to sample) or creativity (creative potential) of a task;
- possibility or inexpediency of tasks patterning;

- level of application (strict – generalised – adaptive algorithm, integrated idea in independently selected and found situations);
- variability in the form of tasks;
- tasks conditioned by the organisational form (collective, group, individual format).

The indicated invariant and variant properties of educational and cognitive tasks are objective. For students, tasks will differ in complexity, time required for their fulfilment, and level of independence. As a result, it will be possible to define students performance in grasping a specific topic (unit, academic discipline):

- – “to know” (when students can cite and present material studied);
- – “to be able to” or “to apply knowledge and skills” (when students complete tasks according to sample and follow the generalised algorithm);
- – “to apply knowledge and skills in a new situation” (when students act at the analytical or creative level).

The indicated properties should be taken into account for particular students. All properties of tasks are combined with each other in one way or another. Therefore, several parameters can be noted in a task at once.

The specific content in an academic discipline allows lecturers to select all the properties of ECTs completing the set of tasks at the didactic level and to determine the methodological aspects of their use (Karayani, & Karayani, 2016; Ponomariova, & Vasina, 2016; Ponomariova, Vasina, & Smyshlyaev, 2017).

The generalised indicators of the didactic system of educational and cognitive tasks include:

- scope and use of basic concepts and skills studied within the academic discipline in real situations;
- possibility of development of basic concepts and skills at the third level (creative activity, in new situations) using all means of assimilation. Note: The first level of mastering concepts and skills presupposes simple rendering or reproducing; the second level is defined by citation of materials and application of knowledge in corresponding situations. These levels characterise the methodological system of ECTs);
- gradual increase in complexity and difficulty;
- variability in the educational path of students;
- immanent (that is, inherent to a specific academic discipline) or special inclusion of skills in cross-disciplinary and extra-disciplinary content;
- ergonomic nature (comprehensiveness that complies with all specified indicators through a minimum number of tasks, each of which has multiple properties).

The generalised indicators of the methodological system of ECTs include selecting and completing: 1) types of tasks; 2) sequence of tasks; 3) combination of tasks; 4) number of each task; 5) difficulty and differentiating fineness of tasks, etc.

In the didactic and methodological system, the following factors of educational and cognitive tasks are distinguished: (see Table 1):

- *major* (substantive and procedural features);
- *supporting* (functions and form of presentation).

Table 01. Determining factors of didactic and methodological system of educational and cognitive tasks

Major factors		Supporting factors	
Substantive features	Procedural features	Functions of the task	Form of tasks presentation
– ECA; – PE; – ECA; – EEVBA.	– individual work; – work in varying pairs; – work in small groups; – frontal work.	– review; – fixing; – monitoring; – degree of independence, etc.	– case; – pedagogical test; – quest; – cognitive map; – programmed control, etc.

Reference: ECA – experience in cognitive activity; PE – practical experience; ECA – experience of creative activity; EEVBA – experience of emotions- and values-based attitude.

The *substantive aspect* is represented by tasks reflecting methodological knowledge and methods of cognition, skills, intellectual processes, knowledge within the studied academic discipline, modes of activity, situations of knowledge application (Kraevskij & Khutorskoi, 2011).

The *procedural aspect* is inherent in tasks, which reflect:

- the levels of assimilation (conscious perception and memorisation, application of knowledge in a familiar situation, creative application of knowledge and skills in an unfamiliar situation, awakening emotional and values-based attitudes to the material studied);
- the formed qualities of knowledge (complete, profound, thorough, systematic, working, flexible, specific, comprehensive, detailed, factual, conscious, sound) (Kraevskij & Khutorskoi, 2011; Ponomariova, Vasina, & Smyshlyaev, 2017).

We notice again that the substantive and procedural aspects of ECTs include parameters for managing how military students explore the educational materials within the studied discipline (in other words, to direct by the training – see above).

The *methodological aspect* of educational and cognitive tasks takes into account the functions of tasks assigned to clarify nature of military students activity at the stages of training, as well as the form of assignments presentation. It is important to note that it is the functions that determine the place of one or another ECT in the methodological system, since the same task can perform different functions.

The *examples* (transdisciplinary, cross-disciplinary or convergent education) of academic disciplines are “Psychology and Pedagogics”, “Military History”, and “History”.

Methodological comment: Both educational and cognitive tasks have one basis. However, the ECT No. 1 is more difficult. We recommend fulfilling this task in small groups or in varying pairs. It is important that military students generate possible ideas during discussion. Some of these ideas are presented as response options in the ECT No. 2. By using the method of participant observation, it is possible to record communication skills, leadership, worldview of military students, etc.

The ECT No. 2 is recommended as an individual task (on-going, midterm, and formative assessment). Military students should carry out this task through reasoning the selected idea.

The ECT No. 1. Studying the operational and tactical potential of minor and major units, military cyberneticists identify characteristic features (for example, quantitative indicators), according to which it is possible to evaluate the fighting capacity of military staff. The views on this issue still diverge. Some argue that minor unit becomes combat-ineffective if it loses 30% of its personnel. Others assume that this amount is either greater or smaller. In your opinion, what characteristic feature of military units is not taken into account? Give reasons for (speak in favour of) your view. Give examples.

The ECT No. 2. *Instruction: Choose one right answer in the list below.*

Studying the operational and tactical potential of minor and major units, military cyberneticists identify characteristic features (for example, quantitative indicators), according to which it is possible to evaluate the fighting capacity of military staff. The views on this issue still diverge. Some argue that minor unit becomes combat-ineffective if it loses 30% of its personnel. Others assume that this amount is either greater or smaller.

This is because military cyberneticists do not take into account:

- a) the influence of ethnic and religious patterns;
- b) **the internal structure of the military unit, peculiarity of its quality** (*the correct answer*);
- c) the personality of the commanding officer (leader);
- d) the combat readiness of the unit.

7. Conclusion

While designing the set of educational and cognitive tasks for the academic discipline (the content of /natural science, humanities, professional/ education), lecturers ought to realise that tasks should have the following peculiarities:

- creating scientific worldview that serve as a paradigm of cognitive and practical activity;
- ensuring the assimilation of all components of social experience;
- facilitating versatile application of knowledge (from reproductive to creative level);
- ensuring the assimilation of cognition methodology;
- stimulating self-education;
- formation of requirements, motives and installations on personal and professional self-development and self-improvement.

Practical relevance of research lies in improving the quality of training of students through the improved professional culture of lecturers, who knowingly select and apply various types of tasks in order to assess students knowledge and skills with the academic discipline.

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