

FUTURE MILITARY ENGINEERS INTELLECTUAL ABILITIES DEVELOPMENT TECHNOLOGY COMPONENTS

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Abstract. The article describes the fact that future engineers intellectual abilities development may be effectively carried out with the help of communicative tasks founded on professional problem-based communicative situations in the English language for specific purposes. The interconnection between intellectual abilities development and studying or professional performance is highlighted and intellectual abilities development is considered to be impossible without any performance. The textbook «Professional English language» and communicative tasks founded on professional problem-based communicative situations are characterized as the main elements of the future military engineers intellectual abilities development technology. Future military engineers intellectual abilities are claimed to involve cognitive component, goal-orienting component and prognostic component. Enabling cadets to solve various professional challenges in cooperation with each other speaking or writing English is claimed to lead to intensive future military engineers intellectual abilities and their components development.

Keywords: *future military engineers intellectual abilities development technology, professional problem-based communicative situations, communicative tasks.*

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The high level of intellectual abilities is one of the critical requirements imposed on professional qualification of military engineers under nowadays social, economic and political conditions. This kind of importance to a large extent is based on the following factors.

Firstly, intelligent business is a critical factor in current economic development. Intellectual property is considered to be becoming the dominate

property form today. Intellectual creativity, which has ideas as its product, plays the role of a definitely necessary social mechanism, which takes a stand against possible regressive tendencies in social development [17]. This kind of reality is claimed to be the reason for the fact that modern higher military education system is to fully comply with its fundamental mission - providing reproduction of national intellectual potential. Otherwise, this mission failure consequences may be irreversibly harmful for the Russian Federation [3]. However, education modernization and forming the «organ of intellect» may guarantee survival for humanity and social prosperity [1,p.25].

Secondly, the age period from 20 to 35 years is considered to be the peak of professional productivity of military engineers. Maximal professional maturity of operational mechanisms of professional intellectual labor is highly demanded in the military engineering field. Enhanced intellectual abilities must be demonstrated by military engineers from the very beginning of their career due to the fact that a wide range of issues concerning the Armed Forces performance is to be solved at the current point of Russian history.

Thirdly, the high intellectual abilities level guarantees career growth prospects for military engineers. High intellectual abilities level promotes personal growth, operating as the key to wellbeing in all life spheres apart from professional one.

In the light of this, future engineers intellectual abilities development technology and its implementation are proposed in the article. The following scientific researches prove to be of a great value for our analysis:

1) According to the scientific theory of P.Y. Galperin mental actions formation may be viewed as an indicator of intellectual development. In the scientist opinion mental actions formation has six significant phases: 1 - motivation, 2 - getting certain information about actions, 3 - carrying out the

actions, 4 - describing aloud the actions being done, 5 - thinking about the actions, 6 - interiorization - mental actions formation via gaining experience. [4].

2) B.M. Teplov investigated intellectual abilities of military commanders. He arrived at a conclusion that the so called «practical mind» [16,p.24] consisting of intelligence and stamina is critical for military commanders. Military professional field imposes high requirements on intellectual abilities of commanders. That is why the scientist paid very special attention to such «practical mind» intellectual abilities as analytical ability, predicting ability, ability to take decisions, flexibility, will and intuition.

3) Three-component model of military intellectual potential presented by A. I. Ibrayev includes:

- military division (intellect of an officer is influenced by military field and its professional, specific characteristics);
- social and cultural division (intellect of an officer is influenced by social environment and its culture standard);
- personal division (intellect of an officer is influenced by cognitive abilities occurring due to generating motivation for intellectual labor) [6,p.90].

The above mentioned technology is based on the listed researches following points:

- intellectual abilities development turns out to be impossible without any context;
- intellectual abilities development is effective in the process of any kind of labor (e.g. studying, professional performance, etc.) [7];
- owing to the specific character of military job, officers intellectual abilities consist of cognitive component, goal-orienting component, prognostic component in our opinion.

Thus, the goal of our research is to put forward future engineers intellectual abilities development technology. The objective of the research is to define and to develop the main future engineers intellectual abilities components. The scientific novelty of the research is as follows: future engineers intellectual abilities development is to be carried out with the help of professional problem-based communicative situations in the English for specific purposes.

Lots of scientific researches in the fields of psychology and pedagogics prove the existence of intellectual abilities and labor interconnection. V. A. Krutetskiy confirmed that abilities exist and are able to develop in the context of labor. That is why abilities may be identified while analyzing certain kinds of labor [9]. B. G. Ananyev believed that abilities development keeps a strong connection with human dispositions [2]. B. M. Teplov characterized abilities as individual psychological traits, which are developed in the context of labor and concern its success [15]. N. S. Leites interpreted abilities as a necessary condition for successful carrying out certain kinds of labor [11]. V. D. Shadrikov made no doubt about the fact that abilities may be both differently developed and differently expressed and occur through successful results of labor [18]. In A. L. Gotsdinner opinion labor is a basic mechanism for abilities development. He considers that abilities develop as a result of the outer world influence on a person and requirements for the labor [5]. S. L. Rubinstein on the one hand described abilities as a precondition of acquiring knowledge and skills, on the other hand highlighted that exactly in the course of such acquiring abilities are developed [13]. Military higher education as a source of such kind of labor as studying may be definitely considered as a cornerstone of abilities development. According to the viewpoint of T. N. Soboleva professional abilities are always complemented with intellectual abilities [14]. She points at the fact that

intellectualization of professional abilities cannot fail to take place due to intellectual operations of a learner. Thus, it is possible to confirm:

- 1) professional abilities are founded on intellectual abilities;
- 2) abilities are developed in the process of studying;
- 3) future military engineers are to possess developed intellectual abilities for successful studying as well as professional performance.

This is the reason why military higher education must be considered as the critical instrument for developing intellectual abilities of future military engineers.

In Military scientific training center of Air Forces “Military Air Force Academy named after professor N. Y. Zhukovskiy and Y. A. Gagarin” the textbook “Professional English language” [12] represents one of the elements of pedagogical technology of future military engineers intellectual abilities development. The textbook is used on the English for specific purposes lessons in the 3rd year. It contains various communicative tasks which are built on professional problem-based communicative situations. They are considered to be another element of the future engineers intellectual abilities development technology. Communicative tasks are oriented on developing spoken language and written language skills with the help of working with monologues accompanied with presentations (e.g. reports), dialogues (e.g. interviews), polylogues (e.g. discussions), written requests, written reports, etc. All the tasks are based on imaginary contexts connected with professional performance of future military engineers. Professional problem-based communicative situations make future military engineers solve various professional challenges in cooperation with each other speaking or writing English.

Taking into consideration the existing concepts and definitions of “intellectual abilities” we may suggest that they are possible to develop with the help of professional problem-based communicative situations. If so, intellectual

abilities development is supposed to be implemented in accordance with a certain conception [8].

In compliance with educational approach intellectual abilities present a combination of cognitive skills developing in the process of studying. One of backbone factors is the English for specific purposes use involvement. Vocabulary expansion, writing reports, holding a discussion in English while doing the tasks founded on professional problem-based communicative situations brings to intensive cognitive skills development and, consequently, to future military engineers intellectual abilities development.

Within social and cultural approaches intellectual abilities are recognized as the result of socialization process under culture influence. One of the important factors which determines intellectual abilities development is language, particularly foreign language. Acquiring verbal and logical intellectual labor means extending intellectual abilities boundaries of learners.

According to genetic approach intellectual abilities are defined as the result of learner adaptation on the one hand, to studying process demands and, on the other hand, to cooperation with other learners [11]. Systematic use of professional problem-based communicative situations in studying process influences greatly intellectual abilities development, as it enables learners to cooperate solving quasi-professional problems. Learners cooperation while working with professional problem-based communicative situations necessitates taking into account various viewpoints, analyzing their strengths and weaknesses. It also stimulates work of intellectual operations and appearance of operational mechanisms which provide learners thoughts flexibility and diversity and predetermines future military engineers effective professional behavior in solving real professional problems.

Under the terms of phenomenological approach intellectual abilities are seen as a special form of thoughts content. The ability to solve a quasi-professional problem is a criterion of intellectual abilities development according to this approach.

Labor approach defines intellectual abilities as a special form of human psychological work, which is characterized by continuance and dynamicity and creates its mechanisms in the process of labor. Intellectual abilities are divided into the abilities to analyze, to synthesize and to generalize in compliance to this approach. Learners practice participating in quasi-professional labor doing regularly the tasks which contain professional problem-based communicative situations. In this way certain intellectual mechanisms develop: new ideas generating, synthesis and analysis of motives, goal-setting.

The textbook «Professional English language» units are devoted to the professional field themes. They are divided into interconnected thematically parts: Spark, Reading or Watching, Vocabulary, Grammar revision, Project. The main textbook component which promotes future engineers intellectual abilities development is Project. This part is a visionary completion of each unit. The tasks contained in Project are all built on professional problem-based communicative situations.

Doing the Project tasks built on professional problem-based communicative situations learners are offered to play the role of a military engineer and to solve a professional problem [12,p.30,p.48].

In one of the tasks, for instance, learners are offered to play the role of a colonel Stepanov who works in TsAGI in cooperation with Israeli colleagues. He is the chief designer responsible for a fighter model MA-3 modernization and is going to write a maintenance request on urgent C maintenance check. Knowing the characteristics of C maintenance (personnel needed, place needed, materials

needed, time expected, inspection needed systems, systems installation, etc.), using certain lexical means and necessary grammar a learner is supposed to fill in maintenance request application form.

A learner may be also offered to imagine he is taking part in military training exercise when one of the helicopters has to make an emergency landing. In this context a learner receives an order to write a report on the incident. Writing a report a learner is to use the incident detailed information such as date, time, location grid, aircraft type, aircraft model, last point of departure, number of persons aboard, other aircraft in the vicinity, problems arisen, detailed flight conditions, pilot's taken course of action, controller's taken course of action, fatalities, injured personnel, description of injuries, duplicated equipment, damage to aircraft, etc. Filling a report application form a learner is expected to use certain lexical means and necessary grammar. Apart from this a learner has to study information from the document called "Regulations and Accepted Procedures in case of Complete Communication Failure", which provides action status for both a pilot and a controller in case of emergency connected with complete communication failure.

One of professional problem-based communicative situations makes a learner imagine as if a learner were "SKAT Systems" director or a chief designer giving a press conference about the world record recently has been set. Namely, the Russian SKAT 640 4G TERRA UAV has set the world flight altitude record for light aircraft weighing less than 1 ton by flying over the highest mountain on Earth, Everest. English is the conference official language. A lot of foreign journalists are going to visit the conference. Therefore, the director and the chief designer are to decide what kind of answers to provide, whereas, journalists are to ask about various details of the event. Their questions may be connected with the main goal of the experiment, the weather conditions, the place of launching, the flight

duration, the UAV technical specifications, the opportunities for the Army, the opportunities for alpinists, the opportunities for rescue services, etc.

It is important to note that communicative tasks built on professional problem-based communicative situations have two critical missions. On the one hand, they greatly contribute to future military engineers intellectual abilities development. On the other hand, they enable learners revise thematical grammar and lexical material studied in the unit.

Future engineers intellectual abilities development technology implementation obviously enables the goal and the objective achievement. The proposed technology develops future engineers intellectual abilities, specifically all the components (cognitive, prognostic, goal-orienting).

Professional problem-based communicative situations used in the textbook communicative tasks include various professional themes: avionics, unmanned aerial vehicles, aerial radiocommunication, tactical communication systems, aerial radio navigation, identification friend-or-foe systems, electronic warfare technology, electronic warfare aircraft, cyber defence. Learning professional themes in English broadens the professional horizon of learners. It also makes them raise queries on these themes and find answers to them. In this way learners take sustainable interest in their future job. Thus, intellectual abilities cognitive component develops.

Completing all the tasks built on professional problem-based communicative situations learners have to solve professional problems:

- negotiating about maintenance time reducing - a leaner has to formulate the report in such a way that will bring to a positive answer;
- describing an emergency landing circumstances in a possible favorable light;

- avoiding providing sensitive information about aircraft specifications - a learner has to compose questions about sensitive information so tricky, that a needed answer will or will not be provided, etc.

So we can say the tasks are aimed at achieving further communicative goals. A learner cannot fail to do such tasks successfully, if intellectual abilities prognostic component is developed.

Military field is characterized by hectic pace of professional life. That is why time for completing tasks is limited. Doing the tasks learners have to work with a lot of professional terminology in English. Learners have to make themselves be concentrated and attentive to the fullest extent and what is more perform the best. It allows for intellectual abilities goal-orienting component development.

Hence, future military engineers intellectual abilities development technology is effectively implemented with the help of the textbook «Professional English language» and the communicative tasks founded on professional problem-based communicative situations in the process of studying.

It seems appropriate to compose in the near future the bank of communicative tasks founded on professional problem-based communicative situations for all study years cadets as a complex integral part of future engineers intellectual abilities development technology.

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