

# Cognitive and professional motives development under introduction of competency model for specialists training

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**Abstract.** In modern conditions of development and improvement of Russian education and its focus on professional activities, it is of particular importance to build an effective and objective system that ensures training of qualified specialists, as well as monitoring and evaluating intermediate and final learning outcomes. At the same time, a two-level training system aimed at improving the quality of higher education and specialists training should be implemented through the improvement of the control system and methods for assessing the quality of education, the development of progressive methods aimed at improving the quality of education. Ultimately, a high level of motivational orientation among graduates, which ensures successful adaptation, accelerated entry into the profession should be formed. As well, young specialists with readiness and ability to perform duties efficiently and effectively need to be trained. The article outlines the essential foundations and the most important components of professional orientation of maritime university cadets in the learning process.

**Key words:** quality of education, competence-based approach, monitoring, diagnostics, control, control technologies, individual learning path

## 1 Introduction

Society's requirements for higher education are determined by an essential feature of the present time being the need for synthesis, stipulated by the transition from an industrial society with its specialization and division of social labor to an information society. The conditions of the information society emerge a new culture, which is different from the traditional scientific and religious one and is called the project culture. In traditionally scientific culture, the world is considered to be given objectively, existing independently of the cognizing object. In the project culture, the world is perceived as something created by people and continuing to be developed by people, as a product and result of the efforts and intentions of people, while a person realizes himself/herself as the only subject of the existing world, bringing meaning to the world around and free in understanding of the world around.

Design culture corresponds to the paradigm of project-based education, understood as the creation of the world, its design and construction. Project-based education is defined as the upbringing and development of a self-determined personality with a project-based attitude to the world. The realization of these prospects directly depends on the readiness of the teacher and the cadet for joint productive activity, for the joint solution of the tasks.

Pedagogical design of the joint activity of a teacher and a cadet is a creative process, since it goes beyond the specific content and determines the socio-cultural significance. It can also be considered creative because

pedagogical design is one of the types of pedagogical activity of a teacher, and pedagogical activity objectively requires a teacher to have a creative attitude to all areas of activity [1].

Thus, the conditions that ensure the improvement of the professional and creative training of future specialists by means of pedagogical design of the joint activities of teachers and cadets are as follows: the use of a cultural approach as a theoretical and methodological strategy for the pedagogical design of joint activities of teachers and cadets; application of the context-active method as a practical one; implementation of pedagogical design of joint activities within the interactive learning.

To identify a set of pedagogical conditions contributing to the effective design of the joint activities of the teacher and students, the following areas are singled out:

- definition of the social order of higher education within the problem under study;
- identification of the specifics of pedagogical design of the joint activities of a teacher and students in higher education;
- development of a future specialist's personality in the process of interaction between spiritual and material culture, in the course of the interaction of participants in joint activities;
- development of each participant in joint activities (teacher, student), first of all, as a subject of culture, as a free, active individuality, focused on free creativity;
- joint activity of the teacher and students as a culture that determines the priority, necessary types and methods of its implementation with the use of a complex of

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pedagogical methods and technologies. Fig. 1 presents the classification of pedagogical technologies used in the educational process of higher and secondary educational institutions.

- consideration of the process of pedagogical design of the joint activity of the teacher and cadets to be a creative one.

Thus, the most effective culturological approach enabling to consider and explore the following:

- development of a future specialist's personality in the process of interaction between spiritual and material culture, in the course of the interaction of participants in joint activities;

- each participant in joint activities (teacher, student), first of all, acting as a subject of culture, as a free, active individuality, focused on free creativity;

- joint activity of the teacher and students as a culture that determines the priority, necessary types and methods of its implementation with the use of a complex of pedagogical methods and technologies. Fig. 1 presents the classification of pedagogical technologies used in the educational process of training specialists.

Higher education teachers often plan the content of training only as a subject, which leads to the fact that the teaching implies only studying aimed at gaining knowledge. At the same time, the task of higher education is to bring the future specialist as close as possible to the upcoming professional activity within the framework of professional and creative training.

It can also be considered creative because pedagogical design is one of the types of pedagogical activity of a teacher, and pedagogical activity in its turn objectively demands of a teacher a creative attitude to all scopes of activity [1].

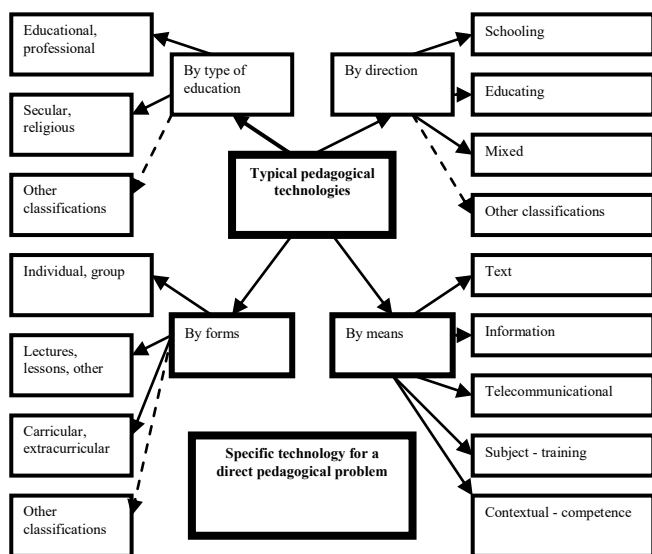


Fig. 1. Classification of typical pedagogical technologies.

## 2 Materials and Methods

The advantages and disadvantages of the competence-based approach to education are as follows. Competence-based, personal, socio-culturological theories or otherwise oriented approaches to education are an attempt to approach the problem of the crisis of

modern education from different sides. According to B.S. Gershunsky, it is expressed, first, in person's helplessness and inefficiency in the face of global challenges of a civilizational scale. If we look at education not from a globalist, but from a more pragmatic standpoint, e.g., from the standpoint of its role in local social production systems, then education most often does not play a leading role. Proceeding from this, education plays a leading role in shaping a competitive society. In Russia, the priority of the need to develop a modern educational system is currently only declared in the Law of the Russian Federation "On Education". At the same time, a competency-based approach should not be considered as a "panacea" for all troubles, to overcome the fact that education is still partially on the sidelines of the phenomena taking place in society and the world. This approach, like all other mono-paradigm approaches to education, has both its advantages and aspects requiring its development and adaptation to the modern requirements.

At a new round of initiating the concept of a competency-based approach to education, there was a need to define the key competencies. Those in the system developed by the Cambridge Examination Syndicate, which are considered when entering the university and starting specialists training, are two groups of competencies: basic and broader ones. The basic ones include: 1) work with numbers; 2) communication; 3) information technologies. The broader ones are as follows: 4) self-study and self-presentation; 5) teamwork; 6) problem solving.

Thus, the main advantage of the competence-based approach to education is that it is aimed at developing the abilities of receiving education and students' confidence in solving a countless number of professional and personal problems and tasks put forward by the needs of society and economy. Competence-based education relates to reality and prepares a person for the transformation of this reality. This is important on the way to overcome the crisis in education. Correlation of cognitive and professional motives and motivational syndrome in the process of teaching cadets of the Maritime University is presented in Fig. 2.

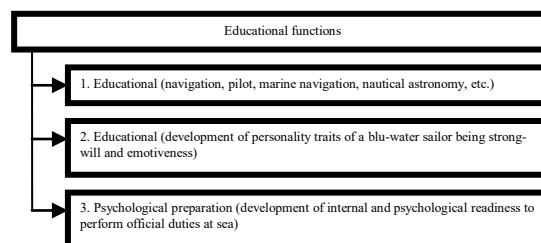


Fig. 2. Main functions of training cadets of the Maritime University.

At the same time, the weak point of the competence-based approach to education is that it is fraught with danger of ignoring human existence, subordinating a person to present or future labor and social activities. This stage in the history of national education existed in the past and exists now. Our great compatriot N.I. Pirogov warned us against a pragmatic approach to

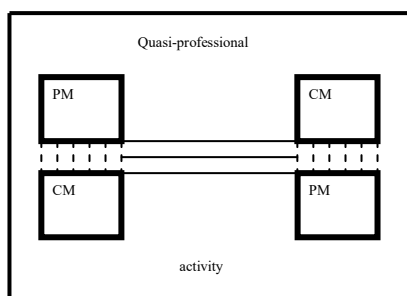
education in “Subjects of Life”, emphasizing that in each of us there is still so much inner independence reminding about living in society and for society, living still by ourselves and in ourselves, that there is not a single need, for any country, more essential and more necessary than the need for “true people” [7].

In contextual learning, the ratio of cognitive and professional motives in the motivational syndrome can be traced quite objectively, since the future professional activity of a specialist is modeled in detail in the forms of actual educational, quasi-professional and educational-cognitive activities [8]. Such dynamics are especially clearly seen in the student’s quasi-professional activity being educational in form and professional in content. This activity in relation to CMS (cognitive motivational syndrome) and PMS (professional motivational syndrome) is a broader system that determines the interaction of syndromes and their mutual transformations in enriching the teaching process with professional content.

The interaction of cognitive and professional motives leads to successive interdependent changes in their status in the hierarchical organization of the general motivational syndrome of learning, which is transformed while shifting from educational activity to professional activity.

The nature of the interaction between CMS and PMS being the main motivational lines in the general motivational syndrome of learning depends on the method of interaction between their components, due to the content and dynamic characteristics of the cognitive and professional motives of the student’s activity.

Thus, the condition and criterion for developing quasi-professional activity is the interaction of the CMS and PMS systems with the corresponding leading motives (cognitive and professional). Scheme of the process of interaction between cognitive and professional motives in the structure of quasi-professional activity is presented in Fig. 3.



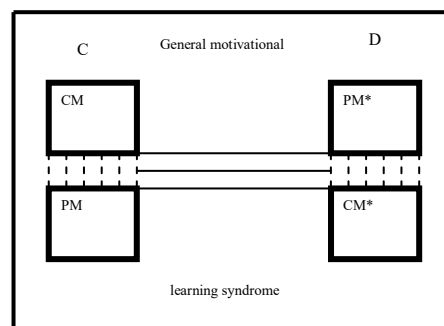
**Fig. 3.** System of interaction between cognitive and professional motives of quasi-professional activity [3]. A is professional activity (by content); B is educational activity (in form); PM are professional motives; CM are cognitive motives.

The educational process of the context type acts as a broader system that determines the dynamic interaction of CMS and PMS in relation to the cognitive and professional motivational syndromes.

Quasi-professional activity being educational in form and professional in content is also a system of interaction between its constituent entities, in particular CMS and PMS. The units of analysis of CMS and PMS are cognitive and professional

motives that change their status in the process of interaction in the hierarchical organization of the general motivational syndrome of learning, which is transformed during the transition from educational to professional activity.

Professional motives, being, in turn, an independent interacting system, continue to develop under the influence of the cognitive motivational syndrome, acquiring some completeness of the equilibrium system. Its dynamics lie in the interaction between the intracomponent of the professional motivational syndrome and intercomponent of the cognitive motivational syndrome [11]. Similar interactions are also inherent in the general motivational syndrome of learning as a system that is broader in relation to CMS and PMS but occur between cognitive and professional motives as the constitutive features of these syndromes (Fig. 4).

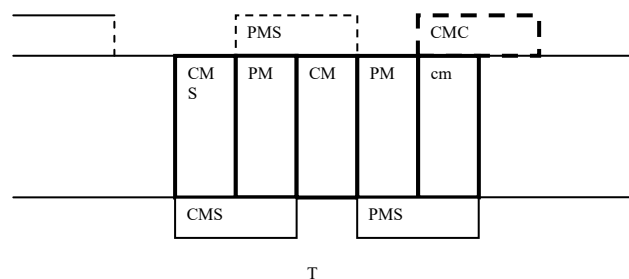


**Fig. 4.** System of interaction between cognitive and professional motives in the general motivational syndrome of learning [4]:

C is cognitive motivational syndrome; D is professional motivational syndrome; CM is cognitive motives in CMS; PM\* is professional motives in CMS; PM is professional motives in PMS; CM\* is cognitive motives in PMS.

The transformation of the interaction method between the components included in the system results in the depths of the lower form, a certain set of elements (“side” (for this form of interaction) products) is gradually formed, which, under certain conditions, is transformed into a qualitatively different structure, more consistent with the new interaction method, thus becoming its adequate condition revealing prospects for the deployment of a new stage of development. Apparently, at this moment there is a qualitative leap being the transition of quantity into quality [11, p. 24].

In the process of mutual transformations, cognitive and professional motivational syndromes are contexts in relation to each other. This means that cognitive and professional motives have a common nature (professional motives are a derivative form of cognitive ones) (Fig. 5).



**Fig. 5.** Dynamics of mutual transformations of cognitive and professional motives in the process of development of the

general motivational syndrome of learning [5]: CM is cognitive motives; T is time factor; PM is professional motives; CMS is cognitive motivational syndrome; PMS is professional motivational syndrome.

Cognitive motives caused by the development of professional motives are no longer those that preceded the emergence of PMS, but mark a new stage in development, acting, in turn, as a by-product of PMS transformations. Thus, both cognitive and professional motives are the product of the intracomponent and intercomponent interaction between CMS and PMS systems.

In the process of interaction of the constitutive components of the PMS, opportunities are created for deploying a new stage in cognitive motives development. Mutual transformations of CMS and PMS occur throughout the entire process of the student's educational activity of the context type, determining the dynamics of development and the structure of the general motivational syndrome of learning. Cognitive and professional motives are not alternative to each other both in their nature and subject content, and in terms of their status in the general hierarchy of motives for the student's educational activity; they act as relatively independent entities.

Educational activity is an open system developed when going beyond the limits traditionally restricted by the goals of mastering knowledge, skills, and abilities. In accordance with the contextual approach, knowledge is transformed from the goal of students' learning activities into a means of their entry into future professional activities, presented in a model form of education. The assimilation of knowledge becomes an intermediate goal of the educational activity of cadets, and its achievement means the acquisition of means for the implementation of quasi-professional and educational and professional activities.

The movement of cadets' activity in contextual learning means the development of its motives. The professional motives forming a professional motivational syndrome (PMS) in their

totality are developed based on cognitive motives developed at the previous stages of educational activity and as a result of achieving its intermediate goals, which form cognitive motivational syndrome (CMS) as a result of their development. In contextual learning, psychological and pedagogical conditions are created for the development of not only cognitive, but also professional motives; these types of motives serve the main motivational lines in the student's motivational sphere and form, respectively, cognitive, and professional motivational syndromes; the interdependent development of these syndromes constitutes the dynamics of development (transformation) of the general motivational syndrome of learning.

The method of interaction within the CMS and PMS is determined by the properties of their components. These properties are content and dynamic characteristics of cognitive and professional motives.

The starting point in understanding the dynamic and content characteristics of cognitive and professional motives in the general hierarchy of motives for educational activity for us is the understanding of professional motives as motives for the development of professional activity itself, on the one hand, and as motives that have a cognitive nature, on the other hand. From the standpoint of content characteristics, the features of cognitive and professional motives can be considered as follows.

Cognitive motives are not always meaningful in learning, representing cognitive interests; formed professional motives always become meaning forming in the motivational sphere of a university student (a trainee who improves their qualifications).

Cognitive and professional motives are internal in relation to the process of educational and professional activity and act as effective motives [9].

According to their status in the general hierarchy of motives for learning activity, cognitive motives can act both as leading and subordinate ones; professional motives, if they are formed, are always leading, determining the nature of the subject's cognitive activity in learning.

Cognitive motives can reveal various degrees of stability, being situational, relatively stable, or stable development of the personality's motivational sphere. Table 1 presents the experimental data obtained during the study in fifteen cadet groups.

**Table 1.** Hyperspace and structure of independent holistic and systemic cycle of educational activity.

No.	System element by cycle's forms	1	2	3	4	5
		System	Environment	Integrity	Level	Structure
1	Oriental	13	11	14	12	14
2	Motivational	11	12	11	14	12
3	Visual	14	14	12	13	13
4	Acoustic	12	11	13	14	11
5	Calorimetric	14	14	12	10	13
6	Thermodynamic	12	13	14	11	15
7	Olfactory	15	10	13	15	12
8	Material	12	13	11	14	14
9	Receptor	14	14	14	13	12
10	Verbal	12	15	15	11	14

Professional motives are stable personal formations that have passed the stage of situational generation of cognitive motives and relatively stable manifestation in various educational situations related to the resolution of problems and tasks of professional content.

### 3 Results and Discussion

Cognitive motives generate professional motives. In turn, professional motives as personal formations generate situational cognitive motives and, thus, determine the further development of cognitive motives. Cognitive and professional motives set by the conditions of contextual learning, in which the future professional activity of a cadet is modeled, are developed in such an interdependent movement in the general dynamics of the student's motivational sphere.

Thus, cognitive, and professional motives in their content and dynamics reveal both similarity and a certain specificity, allowing them to be considered, on the one hand, as relatively independent formations in the general motivational syndrome of the subject of learning, and as integral systems (CMS and PMS), manifested in mutual transitions and mutual influences of these motives, on the other hand. Consequently, professional motives are not alternative to cognitive ones, which are nearby or coexist in parallel. Professional and cognitive motives have a common genetic basis, are characterized by mutual transitions and transformations altering the content and dynamic characteristics of the general motivational syndrome of learning. Professional motives are derived from cognitive ones, but being formed, they become the cause of the subsequent development of cognitive motives.

The analysis designates the following dynamic picture of the interdependent development of cognitive and professional motives in the process of learning activity, dynamically modeling the subject and social content of future professional activity in contextual learning:

- 1) generation of cognitive motives in problem situations;
- 2) generation of cognitive motives through the development of emotional and semantic formations;
- 3) generation of professional motives;
- 4) generation of cognitive motives through emotional and semantic formations that express a biased attitude towards the subject;
- 5) generation of professional motives amid shifting the subject of cognitive activity to its by-product (in quasi-professional activity);
- 6) generation of professional motives by generating emotional and semantic formations;
- 7) generation of cognitive motives in a problematic situation of professional content on the basis of established professional motives (as a product of PMS);
- 8) generation of cognitive and professional motives by developing emotional and semantic formations;
- 9) mutual transformations of cognitive and professional motives in the process and as a result of intra-component and inter-component interaction of CMS and PMS.

Numerous psychological and pedagogical studies on the problems of higher education identify many factors that determine the development of certain characteristics

of professional motivation. At the same time, the substantive relationship, and interdependent dynamics of the development of cognitive and professional motives in the general system of motives of the educational process have not been sufficiently disclosed.

The theoretical substantiation of contextual learning aims to solve this problem. The contextual learning is oriented primarily to vocational education and considering the development of cognitive and professional motivation as a central link in the entire process of a specialist's personality development.

The motivational sphere of the subject of learning being the motivational syndrome reflecting the content and dynamic characteristics of this sphere and enabling to take a holistic view of the complex dynamic formation can be a unit of the analysis of the motivational sphere being a system of motives and subjective forms of their manifestations in the activity of the subject [10].

The formulated theoretical provisions on the interdependent development of cognitive and professional motives of cadets of maritime educational institutions in contextual learning have been confirmed in applied research. Cognitive activity in learning can be conditionally represented as an activity for solving educational problems; professional activity (specified in training in a model form) correlates with the activity of solving practical problems. The motives stimulating both these activities will also differ in subject matter.

### 4 Conclusion

The subject of cognitive motives is knowledge, which becomes a means of entering the context of professional activity in the learning process, modeling it dynamically. Opportunities are being created to transform this subject into a qualitatively different subject of professional motives, i.e., the production and transformation of the product of labor, although acting in a model form. Consequently, the goal and result of cognitive activity is the transformation, development of the subject in the sense of mastering (discovering) new knowledge for it, and the goal and result of professional activity is the transformation of its subject into a product based on the acquired information (which thus becomes knowledge) as a means of such a transformation [11].

As a result of the transformation of the subject of educational activity in the process of its development (according to the mechanism of shifting the subject to a by-product), the fact of transformation and the meaning of this activity becomes obvious: the meaning of cognitive activity (transformation, development of the subject manifested in mastering the means of the future professional activity being knowledge and ways of acquiring it) is transformed into the meaning of professional activity (transformation of the subject, methods and means of professional activity itself).

It can be argued that in the situation of solving any practical task or educational problem at school, university, both actual cognitive motives and practical (professional) motives are presented, since the student uses theoretical knowledge as a means of solving them. Apparently, this explains the ease of mastering the content of such subjects as mathematics, physics, a

foreign language, provided, of course, that the student does not lose the logic of deploying the content of these subjects. One of the advantages of contextual learning lies in the fact that it provides ample opportunities for using theoretical knowledge as a means of regulating practical actions.

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