

# DUAL PROFESSIONAL COMPETENCE AS A DUAL CONTENT THEORETICAL FOUNDATIONS OF VOCATIONAL EDUCATION SYSTEM DEVELOPMENT

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**Abstract.** *The article deals with dual professional competence as a dual content of the theoretical background of vocational education and the development of the system.*

**Keywords:** *system of dualism, dual content, innovation cycles, technical direction, pedagogical activity, professional training, teacher.*

## Introduction

Modern engineering and pedagogical education satisfy the needs of society for vocational education services based on the training, retraining and advanced training of highly qualified teachers for teaching professional and general technical sciences, as well as vocational training, vocational education and is intended for the implementation of industrial training at higher education enterprises. The pedagogical activity of an engineer-teacher is dual (two-sided) and involves the synthesis of professional and pedagogical knowledge and skills: engineering and psychological and pedagogical. In addition, the professional and pedagogical skills of an engineer-teacher can be generalized [2], so the professional competence of such a specialist should also be generalized (dual), i.e., common for a trainee teacher and computer specialists. The content of the engineering training of a future engineer-teacher does not differ from the content of an engineer's training in the relevant field, which leads to the conflict between the technical direction and the engineering and pedagogical activity of the graduate

Given that the substantiation and development of the dual content of the professional training of future engineers-teachers in the field of computer technology is a complex systemic problem, it requires a thorough comprehensive analysis and development. The presentation can be based on the need to develop the dual content of vocational education based on a systematic approach to formalizing the presentation of the dual content model to conceptual general scientific principles [2; 3; 4; 5].

According to the content distribution classification [4; 6] we use the distribution of the two subsystems of the system, similar to the internal and external infrastructure, to develop a dual content of vocational training.

In our case, the main component of one of the subsystems of the content of vocational education is included in both components, primarily as an intermediate in relation to external structural elements;

Secondly, it serves as one of the external (apical) clearly defined elements.

Literature review and research methodology

Thus, the first dual corresponds to the structural duality of the professional training of future engineering teachers, which deeply combines the content of engineering and psychological and pedagogical training and works as an external subsystem. The second identity is functional and is first developed as a result of the dualization of the content of the

professional training of future specialists in the field of education. Such a dual educational activity involves the simultaneous activity of future engineers-teachers in the role of a student and as a teacher of technical sciences. Thus, the dual content of vocational education should be of two dual subsystems: structural and functional.

In his study [7], N. Lazarev confirms that the content structure depends on the degree of certainty and certainty of the basic laws and principles operating in this area. Therefore, the main patterns in the field of professional training of future engineers-teachers allow a specialist to solve specific production, pedagogical, scientific and other tasks. That is, the dual content of vocational education should include information, skills, creative experience and the experience of emotional respect for the truth.

N. Drozdov [8], V. Romanov [9], V. Spitsnadel [10] to ensure the development of professional qualities of future engineering teachers and development of managerial dual content to ensure the development of professional training of future engineer-educators. Teachers Requirements for the development of systems for creating dual content:

1. The content of the dual system should create a set of qualitatively different elements that can be considered as a system forming hierarchical structures.

2. The content of the dual system should be characterized by the presence of integral links with qualitatively different elements of the structural system and their properties. The presence of an integral link in the dual content system distinguishes it from the binary content system, which provides a conglomeration of individual engineering objects and objects of psychological and pedagogical training and activity. The main integrative relations in the dual content of vocational education should be such as “single-general”, “general-general”, “general-single”, “general-private”.

3. It is necessary to develop a specific organizational structure for reducing the level of uncertainty in the dual content system. Two-level structural subsystems are characterized by linear and hierarchical structures, and the functional subsystem has a branched, concentric and methodological structure.

4. The system of dual content of vocational education is determined by the following features: uncertainty and emergence.

That is, the impact of system performance does not affect the performance of each subsystem separately, and the main functions of the activity of each element of the system are incompatible with the functions of the whole system.

5. The dual system must be infinitely structured in accordance with the fragmentation of subsystems.

6. The dual content of vocational education should be characterized by the presence of the same features and methods of analysis at any level of the system hierarchy.

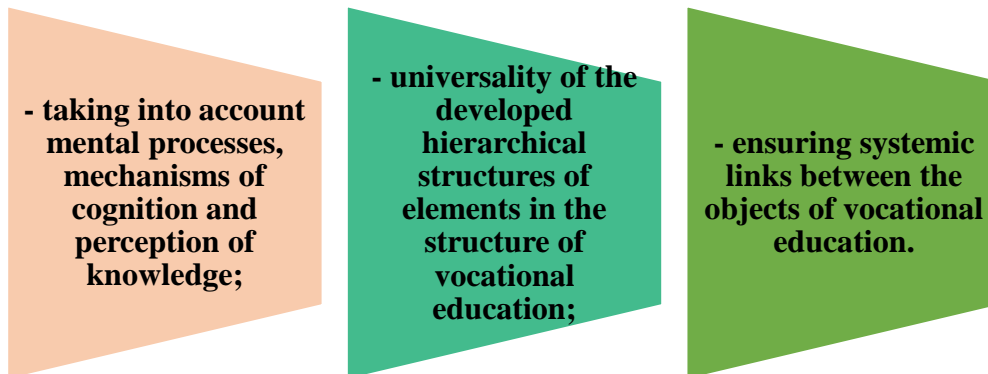
#### Results and discussion

In our opinion, these requirements can be implemented in the development of a dual content system in the future due to the gradual expansion of the system of professional education of an engineer-teacher.

When developing a dual content system, the partitioning method allows you to divide the system into subsystems, which, in turn, can be divided into components. If the subsystems received as a result of decomposition, are not elementary, i.e. do not exist at the level of this description for use, they should be separated later. The division of the system into subsystems

in the general case can be done indefinitely, and this is determined by the composition of the separating properties and the order of their use [9].

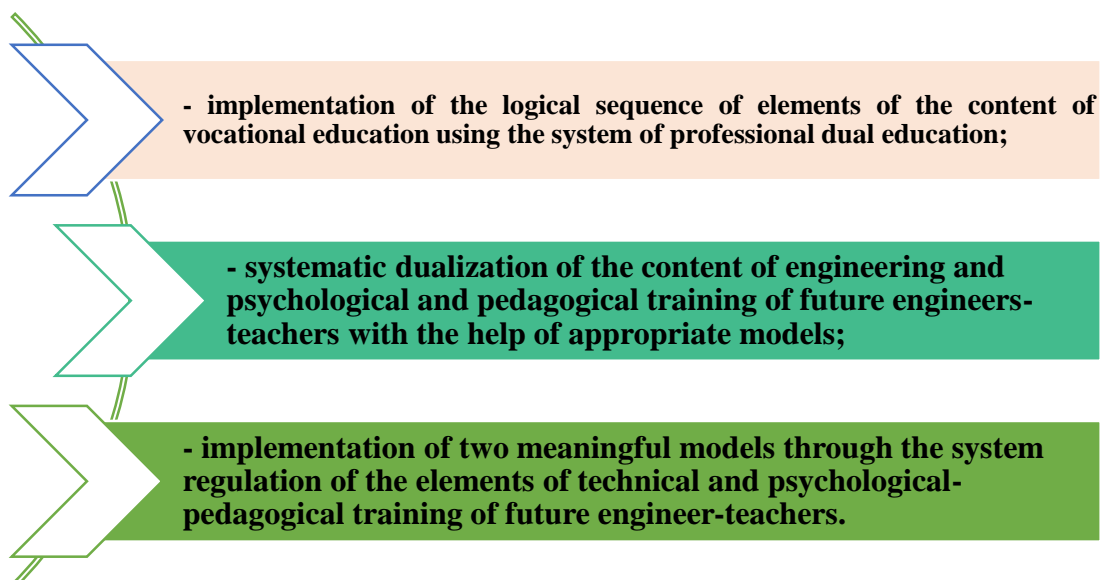
This is the most appropriate semantic network model for expressing the content of vocational training. However, it is necessary to improve the ability to implement functions that meet the following requirements:



The first step in solving this problem is the development of structural models of the system of dual content of vocational education, reflecting the interdependence of engineering and psychological and pedagogical components of the dual didactic process. The science of psychology has developed a sufficient number of models to represent objects. Demonstration models by F. Klix [11] and N. Lazarev [7] are the most effective.

Consider a descriptive model for expressing concepts in memory F. Klksman [11]. The author makes "character" a basic concept, thus understanding the generalization of all units of memory. As characteristics, complex characteristics and complex relationships between memory units should be considered. The use of functions allows you to separate the classification of concepts.

The above concepts, based on philosophical, general scientific and psychological-pedagogical methods and models, allow:



To develop a system of professional dual competencies as a component of the theory of dual content of vocational education, let's consider the existing approaches to the definition of professional skills.

The training of qualified specialists is one of the main goals of the educational process [7].

Engineering and pedagogical education has a dual character [12, 48]. Learning is determined by the structure of the engineering object and the structure of the pedagogical object, the structure of specialized activities in a particular area of production and the corresponding pedagogical activity. That is, the dual level of the content of vocational education is observed both at the structural and activity levels. These philosophical categories correspond to the relationship of "space" and "time" and are considered to be their direct reflection in the educational process. The key to the problem of system development with dual professional competence is the distribution of professional activities as the basis of their development. In order to develop the dual professional competencies of engineering teachers, we will consider the main approaches to the dissemination of professional knowledge. The main idea of dual professional competence is that the main result of the professional training of future engineering teachers is the ability and readiness of a specialist to effectively and work creatively in various socially significant situations.

The main directions of the formation of the professional competence of an engineer-teacher can be identified through the analysis of the content and description of their activities, as well as professional activities. Competence is not abstract, but arises, reveals, reveals in the course of specific activities.

In this regard, it can be said that competence is the ability and the culture of carrying out this or that activity. This provision corresponds to the position of the Department of International Education, Development and Educational Standards: a competent "concept is defined as the ability to carry out professional activities..." [13, p. 20].

According to scientists [13; 14; 15], specific Features of the core professional competencies are:

- versatility (possession of competence allows you to solve various problems in everyday life and professional activities);
- belonging to the field of meta-education (it is an interdisciplinary and interdisciplinary competence and can be used in different situations);
- potential opportunities (competences require the presence of a common and professional intelligence (potential), abstract and professional thinking, self-reflection, self-determination, self-assessment and demand from others);

The development of knowledge, skills and personal qualities is the final contribution to the formation of the competence of a future specialist, which is the ultimate goal of professional training. The educational process implements a generalized model of a specific profile of a specialist's professional activity, according to which the student must have knowledge, master certain types of activities, process and develop professionally important qualities. Competence is a set of information about things, objects, means of activity, objects that ensure the quality of a particular work. A set of competencies is a solution to a professional problem in a particular area.

Analysis of scientific works [15; 17], today the focus is on the problem of identifying and highlighting competencies, which will make it possible to determine the lack of a systematic, structured, coordinated and a consistent list of professional competencies of future engineering teachers. However, to develop a dual system of professional competencies Dj. Ravenn [17] noted that competency-based components are in the process of realizing the interests of mankind, as well as G.K. According to Selevko [15], competencies should correspond to the description of human activity and, therefore, their classification to classify the main activities.

As a result of professional activity, any work process is characterized by technological and

organizational operations, as well as management operations. The name of the workflow is determined by the name of the technology. Thus, the process of engineering and pedagogical work (professional activity) is manifested by dual activity and, therefore, determines dual professional competencies.

Professional competence is a matter of professional training and work on measuring tasks and job responsibilities, measuring compliance with the requirements of professional activity. and main criteria. Since professional competence implies a stable ability to perform a particular type of activity, it is advisable to characterize it with an activity approach.

In this context, professional competence can be understood as one of the components of professional training for a particular type of activity. A proactive approach is aimed at the formation of an active working capacity, working in all forms, including professional field. The active paradigm of education changes the role of knowledge, the main goal of education becomes its integral part, its main goal is the means of activity. Thus, the learning process should create the necessary conditions for the acquisition of practical skills and should be focused on the acquisition of special knowledge and practical skills for further improvement of future professional activities. To represent the system of dual professional competencies, it is advisable to use round (circular) models. This suggests that the main problem in applying the structural-logical schemes of the traditional presentation of the content of vocational education is the specificity of binary specialties. It assumes the presence of a large number of elements of the didactic process that have a similar structure and have similar logical objects, connections, processes, etc. This turns the traditional structural-logical scheme into an uncontrollable chaos of objects and relationships between them. One of the directions for solving this problem is the rejection of the traditional form representing structural-logical schemes, and the transition to a ring form with the allocation of dual elements of the system.

In general, we are talking about the use of an n-layer circular (circular) form of structural-logical models with a combination of dual elements based on dual relationships. The main advantage of using the n-layer circular form in comparison with the traditional structural-logical scheme is the appearance of a description of objects, processes and activities of professional training in dual specialization. This can be explained by the fact that the components and processes of training are used in the complex integration of engineering and psychological and pedagogical objects to the integrated dual blocks. The existing forms of information representation are characterized by a high degree of differentiation, which makes it difficult to represent and display dual relationships. However, this is not However, this does not mean that only circular forms of information and traditional structural and logical schemes should be abandoned.

### **CONCLUSION**

Based on the results of developing a model of a system of dual professional competencies for future engineers-teachers in the field of information technology, its practical activities will ensure the deep integration of engineering and pedagogical components into teaching engineering activities in pedagogy. This is done by introducing elements of the technique of teaching technical sciences.

It should be noted that the change in the structure of professional competencies and the spread of dual systems of professional competencies fully meet the requirements of state educational standards and modern approaches to the professional training of future engineers and

teachers of information technology. Thus, the development of a system of dual professional competencies can be facilitated by:

- optimization of the educational process;
- formation of a professional orientation of training and the personality of students;
- development of self-reflection of students and, as a result, improvement of the quality of education in technical sciences.

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