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FUNCTIONAL MAP OF A PROFESSION: THEORY, METHODOLOGY, MODELING BASED ON COMPETENCE

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The article deals with the questions of a profession functional map modeling, which includes the main objective of the profession and contains all the basic functions and function modules.

The main goal of the article carried out within the framework of the grant is development of methodological recommendations on introduction of innovative approaches to the development of construction tools, methods of implementation and updating the variable part of the educational program based on a set of professional functions. The focus is on the modeling procedure of the functional maps based on competencies. The article presents some examples of modeling a functional map for the teaching profession.

The practical significance of the article is that it offers the basic algorithms for modeling of functional map of the profession based on universal competencies which are basic for different levels of education.

Keywords: functional map of the profession, the functional model, the modular program based on competencies, a profession functional map modeling.

1. Introduction

1.1. The urgency of the problem

In connection with the transition to new Federal educational standards educational institutions face the problem of formation of educational programs in the professions and occupations. One of the important aspects in the development programs is the definition of the specificity and mechanism of formation of the variable part of the program.

One of the objectives of any educational institution is the development of curricula and programs of disciplines and professional modules of the training practice, in which requirements to the results of the program: competencies, expertise, knowledge and skills are clearly defined.

Analysis of skills requirements produced on the basis of the comparison requirements of the new standard and functional card provided by your employer, allows you to define job functions demanded by the labor market.

1.2. Explore Importance of the Problem

The process of analysis of the qualification is determined by the labour market, so employers should work closely with professional education institutions. Only through cooperation and conti-

nuous interaction necessary quality training and its compliance with professional results and educational standards can be provided.

The creation of a profession functional maps is the initial step in the development, implementation and improvement of for specialists' training programs based on competencies, forming the cycle of quality educational programs.

In world practice there are different approaches to describing employers' requirements for vocational education graduates, but they all describe the requirements for quality and content labor in a particular area of professional activity.

1.3. The main goal of the research work

The main goal of our research work carried out within the framework of the grant is formulation of methodical recommendations of innovative approaches to the development of the educational program based on a set of professional functions (*the profession functional map*).

2. Methodological framework

The fundamental methodology for developing a functional map of the profession is **functional analysis** is the description of labor activity through the functions and outcomes, which

makes it possible to consider changes in technology and work organization on the regional labor markets, where the graduates of educational institutions will work.

The method of functional analysis assumes the “addressing” types of professional activities of functions, the combination of which achieve the main target of the profession.

Unlike the method “job descriptions” that was popular a few years ago, the method of functional analysis is able to consider the dynamics of modern production, the promising trends of its development and intends to conduct a wide survey of the industry. This method is of special value for vocational education. Thus, the functional map describes promising requirements to perform job functions, providing efficiency companies in the industry. In addition, each work function forms the structural unit of description – the “unit of the functional map”.

3. Results

3.1. Basic directions of modeling of the functional map

Each unit of the functional map clearly describes the following: title of the job function, the actions for fulfillment of this function, the characteristics of the qualification level (if the function card is to mind the professional standard), required knowledge and skills.

Due to this structure, a functional map can be projected into the requirements of educational standards and programs of professional education. Namely, each unit of functional maps can be transformed into educational element or module of study, the learning outcome for each element of the functional map is the function which is to be master.

Application of functional maps of a profession has a wide enough range of possibilities in the field of solving practical problems facing the subjects of professional education.

Thus, the functional map of the profession can serve as a basis:

- to develop the variable part of educational programs;
- for the development of programs of further professional education;
- to build modular programs based on competences;
- to build training programs on various qualification levels;
- for the development and certification of tasks for students;

- for an analysis of the material-technical base of educational institutions;

- for the development of the composite rating sheet assessment of mastered skills in the process of internship;

- for ranking of enterprises for the volume of work performed in the framework of professional activities;

- to interact with the enterprises in terms of planning and forecasting of vocational training for certain types of activities etc.

For employers functional map may be of interest in terms of forming the professional standards, formation of requirements to candidates for work, the means of evaluating staff.

3.2. The procedure of developing a functional map

The procedure of developing a functional map includes:

the purpose of the functional map – the definition of requirements for standards within a particular professional field (profession);

the structure of the functional map:

- description of the purpose of professional activity (the purpose of the field of professional activity);

- description of the kinds of work necessary to perform the professional activity specified purpose;

- description of the functions of each type of work.

The main goal briefly describes the area of professional activity as the total result which must be achieved. The activities ensure the achievement of main goals related to professional activity (goal set in views). The number of species depends on its complexity. Labor functions. Every kind of labor activity “converts” to a specific job function that must be performed in this type of work.

Function module describes a holistic set of subject skills, knowledge, attitudes and experience (i.e. competence), formulated in the form of requirements to be met by the student at the end of development module (7).

Functional map of the profession (specialty) includes a main objective of the profession and contains all the basic functions and functional modules, clusters of competences (Fig. 1).

The main functions are descriptions of functional action, ensuring the achievement of the main goal. Main functions allow to achieve the main objective of the profession and represent a description of the specific actions by which

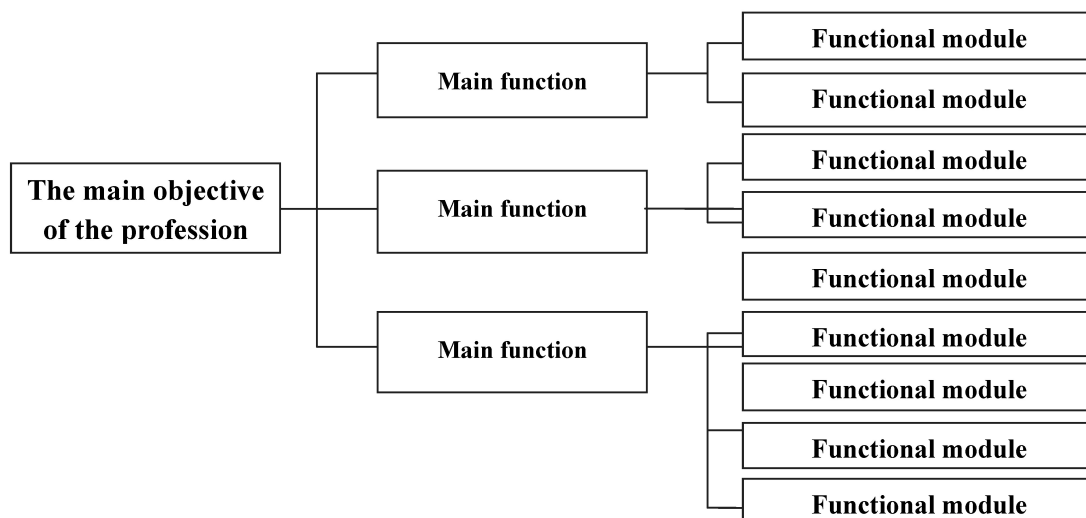


Fig. 1. A model of the profession functional map (specialty)

we achieve the main goal of the profession. The number of functions depends on the complexity of the profession (4).

Each function contains a comprehensive group of requirements to ongoing actions. These functions will be further analyzed in the wording, each of which will be a training module. On the map they are called functional modules. The functional modules describe the specific actions that comprise a particular competence. Each functional module should be specific. Functional modules are components of the technical process that are designed to achieve the main goal of profession.

Overarch modules

Current practice includes employment requirements, which we describe as “overarch modules” or “professional modules”. Overarch modules do not represent actions in themselves, but affect the organization of work, relations with other people in the workplace and social responsibility for the environment.

Adapting modules

The functional map contains in addition to functional, overarch modules and adapting modules. “Adapting modules” or “base units” by themselves do not produce tangible results and they are related to general professional disciplines.

Overarch modules apply to all modules. Adapting modules are more traditional.

A functional module is an integrated description of specific actions necessary to perform basic functions (2).

Additional applications of functional maps to the profession in the educational process:

1. Information resource for the development of programs of basic vocational and further education.

2. Interaction with enterprises in planning and forecasting training for the profession.

3. Development and attestation of quizzes for students.

4. The content of career guidance for prospective students (reading the content of the profession).

3.3. Guidelines

Things to remember when developing functional maps:

- proceed from the needs of employers analyze the skills requirements. Identify: the main goal of activities within the profession or specialty the main functions that the employee performs (i.e., specifically what the worker does), and it should be self-sufficient integrated functions, the development each of which gives you the chance for employment, self-contained, integrated action, the development of which gives employment opportunities);

- functional modules (separation of the major functions on the components of the whole action);
- overarch modules;
- adapting modules.

In the formulation we follow the rules of the description and use verbs in the infinitive form. Once again, please note that the obtained scheme – functional map – displays the requirements of the workplace. In this regard, in the development of functional maps employers should participate. A complete functional map should be examined by employers.

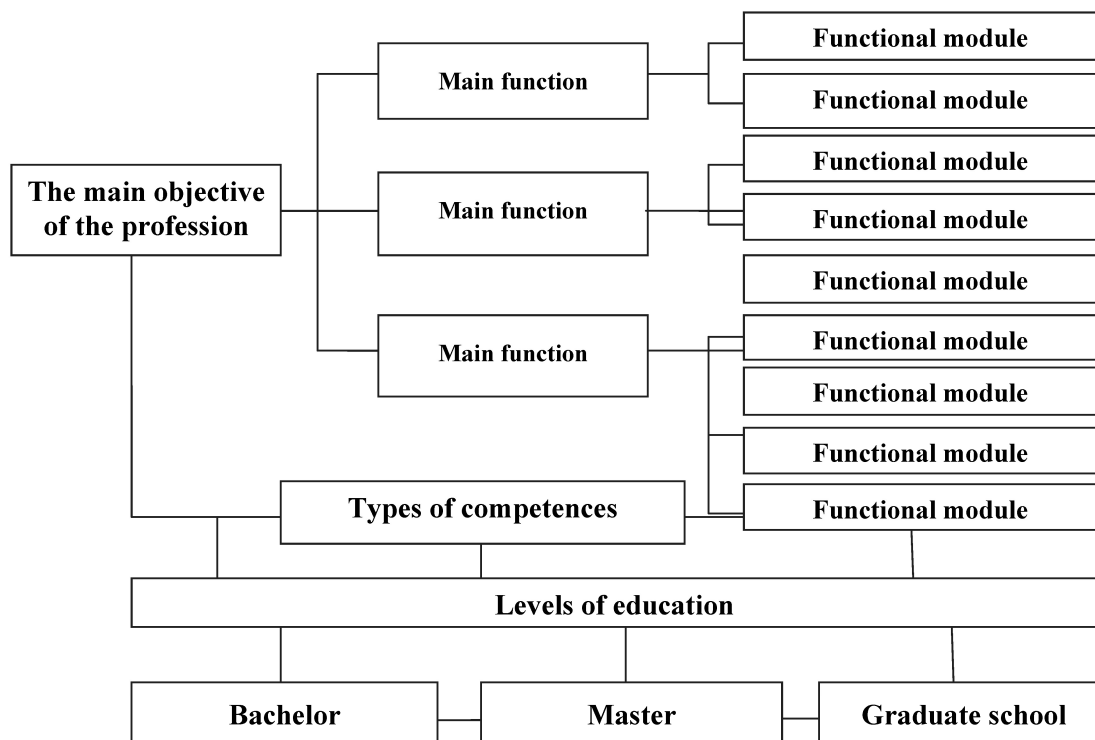


Fig. 2. A model of the functional map based on professional competences

Competence profile

The basis of the modular structure is the competence profile that describes the requirements of the profession, together with the common goal of learning. In the general structure the name of the competence profile follows the traditional description, for example “a Teacher of preschool institutions” – but the overall goal should coordinate with the key objectives presented in the functional map (Fig. 2).

Areas of expertise

The competence profile is divided into a number of areas of competency, corresponding to the main functions of the card.

4. Discussions

Variants of presented functional maps contain only the basic functional modules. But to achieve the main goal of the profession of specialist in addition to basic always performs some general steps. For example, interacts with colleagues and supervisors; compliance with the rules of occupational health and safety; studying technical documentation, etc. Therefore, the arsenal of any professional specialist should consist of some combination of a number of modules: general and basic. The latter are basic knowledge essential for the implementation of the basic and common operations. Accordingly each specialist must possess several types of competencies:

basic – to perform basic operations; general – to perform universal operations.

G.G. Satarina, E. A. Belarussov, Y.Y. Valisava (1) consider in their study the structure and the content of the variable part of educational programs of secondary vocational education on the basis of employer’s requirements based on the functional map of the profession.

O.N. Oleynikova, A. Muravyova analyze in their work the methodology and rules for the formation of functional maps of professions and types of professional competencies of specialists. In their study also highlights issues and technologies requirements of professional standards for the development of modular training programs based on competencies (3).

While researching the problem of modeling a profession functional map we have come to the conclusion that in the scientific literature there are not enough works devoted to the modeling of a profession functional map based on professional competences of a specialist. These competences can sequentially and clearly reflect the professional functions specified in the professional standard.

For example, the functional map of the profession (speciality) of a **teacher** contains the following main functions (5; 6):

- **Communicative function:** the rules of democratic relationships, evaluation of students work.

• **Organizational function:** the rules of the organization of the lessons and extracurricular activities.

• **Training function:** purposefulness, scientific, differentiation, teaching methods, forms of teaching, priority and assimilation of interdisciplinary rules and concepts, the results of academic work, extra-curricular activities.

• **Educational function:** motivation, autonomy of students, skills of self-education, creative skills.

• **Educative function:** the morals, creative of quality educational work in the classroom.

• **The research function:** self-education and problem-solving teaching process.

• **Constructive function:** the development of teaching materials.

• **Labor function:** the scientific organization of labor, the organization of the material base for training.

For the analysis and evaluation of methods, techniques and forms of teaching for each parameter, as well as the results of education proposed the following criteria: unsatisfactory, critical, satisfactory, good, high, best.

Particular techniques and forms of teaching according to the criteria made on the basis of regularities in the development of the functional efficiency of systems are the tools of the theory of solving inventive (creative) tasks.

The following is an example of the criteria for the parameter “teaching Methods” educational function.

Criteria for evaluating the effectiveness of teaching methods.

Unsatisfactory. The lessons are based of explanatory-illustrative and reproductive methods. Critical. Using explanatory-illustrative, reproductive, and partly creative methods while conducting lessons. Reproductive tasks dominate.

Satisfactory. Using explanatory-illustrative, reproductive, and partly creative and creative methods while conducting lessons. Reproductive tasks dominate.

Good. Using explanatory-illustrative, reproductive, and partly creative and creative methods while conducting lessons. Reproductive tasks with combination of creative activities dominate.

High. Using explanatory-illustrative, reproductive, and partly creative and creative methods while conducting lessons. Creative activity dominate.

Optimal. Using explanatory-illustrative, reproductive, partly creative, artistic and research methods. Creative activity dominate.

Each criterion corresponds to a certain group of methods, techniques and forms (pedagogical tools). For performance assessment, a tutor or a supervisor, it is enough to compare the existing notes and apply the lessons on pedagogical tools with a specific criterion of the corresponding parameter card.

Functional card is designed primarily for introspection and self-evaluation teacher's level of professional skill and planning self-learning in accordance with specific problems in their work.

The functional map is an expert system for certification of the teacher

5. Conclusion

Applications of the profession functional map (specialty):

– functional map as the basic element of a professional standard;

– functional map as a tool for market research;

– functional map as a means of creating a unified conceptual-conceptual field between employer and educational institution;

– functional map as the basis for determining the structure and content of educational programs;

– functional map as a mechanism for enhancing the practical orientation of education;

– functional map as one of the mechanisms of implementation of the dual model of vocational education;

– functional map as a tool for drawing up the job profile of the employee in corporate systems.

Range of tasks

➤ the development of sectoral regional standards;

➤ the study of the requirements of the employer to the specialist (functional analysis);

➤ to implement principles of unified and practice-oriented approaches to vocational training in cooperation with employers on the basis of functional maps in the profession;

➤ modeling of the elements of the variable part of educational programs updating the content of education in connection with changes in production;

➤ forecasting a specific educational result;

➤ bridging the gap between theory and practice through the establishment of general requirements for outcome of education (what to teach);

➤ developing and refining requirements for the employees (knowledge, skills, competencies), selection, certification and evaluation of personnel.

6. Recommendations.

The functional map is the basis for the formation of the professional competences models and plans of training in modular technology of educational process organization.

The functional map of a profession as an innovative mechanism of educational institutions and employers' interaction in training will provide the creation of more sophisticated programs.

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ФУНКЦИОНАЛЬНАЯ КАРТА ПРОФЕССИИ: ТЕОРИЯ, МЕТОДОЛОГИЯ, КОМПЕТЕНТНОСТНО ОРИЕНТИРОВАННОЕ МОДЕЛИРОВАНИЕ

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Статья посвящена рассмотрению вопросов моделирования функциональной карты профессии, которая включает основные цели профессиональной деятельности и содержит все основные трудовые функции и функциональные модули.

Основная цель исследования, выполняемого в рамках гранта, состоит в разработке методических рекомендаций по внедрению инновационных подходов к разработке инструментов построения, методов реализации и обновления вариативной части образовательной программы на основе набора профессиональных функций, выработанных работодателями и зафиксированных в функциональной карте профессии.

В статье представлены примеры моделирования функциональных карт профессии на примере профессии «учитель».

Практическая значимость статьи заключается в том, что в ней предлагаются основные алгоритмы моделирования функциональной карты профессии, основанные на общих и универсальных компетенциях, которые являются фундаментом для разных уровней образования.

Ключевые слова: функциональная карта профессии, функциональный модуль, модульная компетентностно ориентированная программа, моделирование функциональной карты профессии.

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