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Structural and Functional Model of Training Future Masters of Vocational Training for the Organization of Teaching and the Production Process in Terms of Networking

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ABSTRACT

The urgency of the problem under investigation is due to the fact that, in accordance with the Federal Law "On Education in the Russian Federation" concentrated system of training of working professions, in which the most important specialist in the formation of the qualification is a master of industrial training as the last and only pedagogical and technological unit is substantively defined, which integrates future operating into the real production process. The purpose of the article is to develop a structural and functional model of training of future masters of vocational training for the organization of teaching and the production process in terms of networking. The leading method to the study of this problem is a simulation that allows to consider this issue as a process of deliberate and conscious mastery of future masters of vocational training competencies for teaching and the production process in terms of networking. The article presents a structural and functional model of training future trainers for the organization of teaching and the production process in terms of networking, which consists of target, meaningful, the activity and effectiveness of interrelated components that have their own characteristics, as well as developed organizational and pedagogical conditions of successful implementation this model. Article submissions may be useful to students in educational institutions vocational teacher education system, all types of professional and teaching staff, adapting to the new conditions of professional work in the field of education, for specialists in the field of education focused on designing the content of training.

KEYWORDS
Master of vocational training, networking, organizational and pedagogical conditions, structural-functional model, teaching and production processes

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Introduction

The problem description

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One of the most important tasks of educational policy at the present stage of the organization is a comprehensive partnership in the preparation of specialists of different levels, especially workers, which means, the development and networking at various levels of the education system. An important precondition for more efficient training of workers is strengthening of practice-oriented training process, including through the expansion of the use of elements of the so-called dual training, in which at least 50 percent of the time students have to undergo in-service training on the territories of enterprises (including those in subdivisions of educational organizations) or educational training workshops sites. In addition, one of the central activities is the creation of multipurpose centers of applied qualifications. Development of Centers Network (at least 250 of them will be created by 2018) will provide coverage of all age groups with short, targeted, intensive training programs; ensure efficient use of existing resources, to extend the powers of employers in the management of vocational training and recognition of qualifications.

Of particular importance are centers for industry training and retraining of personnel, involving on the basis of professional educational institutions development and implementation of targeted programs that match the needs of the professional training of citizens regardless of their age, health status, social status, previous education and place of residence. Under these conditions, the most important is a specialist Master of industrial training.

The main professional and pedagogical activity of master of vocational training is practical (industrial) training of students learning for trades programs at colleges, technical schools, corporate training centers. Despite the fact that the production process of learning is based on the general laws of the learning process, it is characterized by specific features in terms of goal-setting, content, logic, didactic principles, organizational forms, methods and means of training related to the formation of professional abilities and skills as a result of productive labor students - the main means of industrial training, especially in terms of networking (Adamski, 2006).

Thus, it is required today not only a demonstration of the reference implementation of labor practices and operations, but the design, the organization of all training and production process aimed at the achievement of educational training programs results, retraining and advanced training of workers to meet the requirements of modern machine-building enterprises. This is confirmed by the fact that the professional teacher of vocational training standards, professional education and further professional education as one of core job functions of trainers includes a duty of the organization of teaching and production process.

In this regard, a difficult task of in the design of competence- oriented content and in creating a learning environment that enables the graduate to achieve professional level set by professional standards is realized by the system of educational institutions of secondary vocational education (SVA) and implemented by training programs for industrial training masters specialty 44.02.06 Vocational training is, which consists not only in the design of competence-based training content of trainers.

In consideration of the present circumstances, to solve this problem is possible by the implementation of network interaction of educational institutions and machine-building enterprises, interested in improving the

quality of training of workers, and masters of vocational training (Davydova et al., 2016).

Increased attention to the problem of preparation of the master of vocational training to the organization of teaching and the production process in terms of networking is a natural and objective need of modern vocational teacher education.

Literature review

Conceptual directions and positions of professional and vocational teacher education were considered by S.Y. Batyshev (1999), E.F. Zeer (1988), P.F. Kubrushko (2001), V.S Lednev (1991), G.M. Romantsev et al. (2003), E.V. Tkachenko & G.D. Bukharova (2006), N.K. Chapaev (2013) and others. Some aspects of professional teacher education related to the formation of certain professional skills to perform a particular function of labor, with the study of psychology and the functional structure of the teacher of vocational schools are represented in the works of A.T. Malenko (1986), O.A. Orchakov (2004), V.A. Skakun (1985) and others.

Thus, the stated problem is an actual, social, scientific and practical research study . Its decision is consistent with the strategic guidelines of the state policy, reflected in the "Concept of modernization of education for the period up to 2020"; in the "Strategy of development of the system of training of personnel and the formation of qualifications applied in the Russian Federation for the period till 2020"; in a "set of measures aimed at improving secondary vocational education system in the 2015 - 2020 years"; in the "Strategy of development of inclusive secondary professional education in the Russian Federation." These documents are determined by the direction of the development of system of secondary vocational education such as: ensuring that the qualifications of graduates of a modern economy requirements by improving the content and target student learning technologies; consolidation of resources of organizations of science, business and educational organizations in networking; development of system software for the implementation of practice-orienirovannoy training, dual training, international movement WorldSkills; monitoring the quality of training, independent assessment of qualification.

Methods

Research methods

During the research the following methods were used: theoretical (analysis, synthesis, concretization, generalization, analogy method, modeling); diagnostic (questionnaires, interviews, testing, method of tasks and assignments); empirical (the study of experience trainers of educational institutions of secondary vocational education system, regulatory and instructional documents, pedagogical supervision); experimental (notes forming, control experiments); methods of mathematical statistics and graphic results.

Experimental research base

Experimental research base is a branch area of «Russian State Vocational Pedagogical University" in Berezovsky, a private institution of additional vocational training "Training Center" of Uralmash ". 104 people took part in the

study involved into studying the program of secondary vocational education specialty "Vocational training" (specialization - Welding production).

Investigation stages

The study was conducted in three stages:

at the first stage normative documents, scientific-theoretical, psychological, pedagogical and methodological sources of information of studies problem; analyzed the specifics of professional-pedagogical activity trainers, specifies the main directions of research were studied and analyzed;

at the second stage - specifics of training of future masters of vocational training in the SVE system were training of future masters of vocational training in the system have been studied and analyzed; description of professional competences masters of industrial training in the design of competence-based training content in the study of the professional module "Organization of educational-production process has been identified; model of professional competencies of the students in the study of the professional module "Organization of educational-production process" has been developed;

at the third stage - the processing of the results was carried out, the implementation was carried out in the educational process of teaching and methodological support of the professional module "Organization of educational-production process" for the industry, "welding production" was put into practice , conclusions were formulated , the results of the study were represented.

Results and Discussions

The developed model of training future trainers for the organization of teaching and studying of the production process is based on the integrity and consistency, interconsistency and interactions of its components.

In developing the model, in addition to the requirements of professional standards "teachers of vocational training, vocational training and additional professional education" and FSES (Federal State Educational Standard) SVE (Secondary Vocational Education) specialty Vocational training (on branches) are also taken into account along with:

- Professional standards "Welder";

- FSES SVE, specialty 22.02.06 Welding production.

In addition, it was taken into account trends in the development of mechanical engineering and welding engineering in the field of technology, equipment, materials, tools.

The conceptual basis of the model of training masters of vocational training to the organization of teaching and studying of the production process in the implementation of programs of working professions is the competence-modular approach.

The model is aimed at the formation of professional competencies of future trainers in the process of development of the professional module of the basic professional educational programs of secondary vocational education specialty "Vocational training" in terms of networking, facilitating their adaptation to new conditions of teaching and the organization of the production process in the preparation of working professions.

The developed model of training future trainers for the organization of teaching and studying of the production process in the implementation of educational programs for occupations workers welding production program includes targeted, meaningful, and effective components of the activity (Fig. 1) (Dorozhkin, Tarasyuk & Lyzhin, 2015).

The activity component model provides a sequence of formation of professional competence of future trainers, the development of professional-pedagogical thinking, design, research, technological skills, independence and activity. In our study, we used elements of learning technologies, such as a dual one , that will make the process of preparing the most practice, -and helps to understand the features of functioning as a modern welding production and the organization of teaching and the production process of preparation for the profession, "welder" with its inherent dynamic and multi-tasking.

Efficient component of the model provides assessment and determination of the actual level of formation of professional competencies specific to the type of job functions professionally and pedagogical activity "organization of teaching and the production process."

Task component model defines the purpose and the purpose of the model, namely the formation of professional competence of the future masters of vocational training to perform their job functions relating to the type of professional-pedagogical activity "organization of teaching and the production process.

Substantial component is directly related to the other three components of the model. This component involves designing competence-based professional content module (PM) "The organization of educational-production process" and an interdisciplinary course (IC) "Methods of industrial training" on the example of the profession "Welder".

For the most effective implementation of this model in the study, the organizational and pedagogical conditions are identified:

- Competence-oriented content of training (vocational work program of the module "Organization of educational-production process" and the interdisciplinary course "Methods of training" on the example of the profession "Welder");

- Educational environment (industrial incubator is developed that is the subject of innovative educational infrastructure, organized in a format of networking of professional educational institutions and leading companies in the region, providing targeted training and retraining of trainers, that contributes to their professional and pedagogical competence, adaptation graduates of the system of professional teacher education to professional production activities according to the particular kind of industry through the creation of an enabling environment, including a modern material and technical and information base (Tarasyuk & Lyzhin, 2015):

- Learning technology (dual technology of training; technology of concentrated training, problem-based learning technology, information technology).

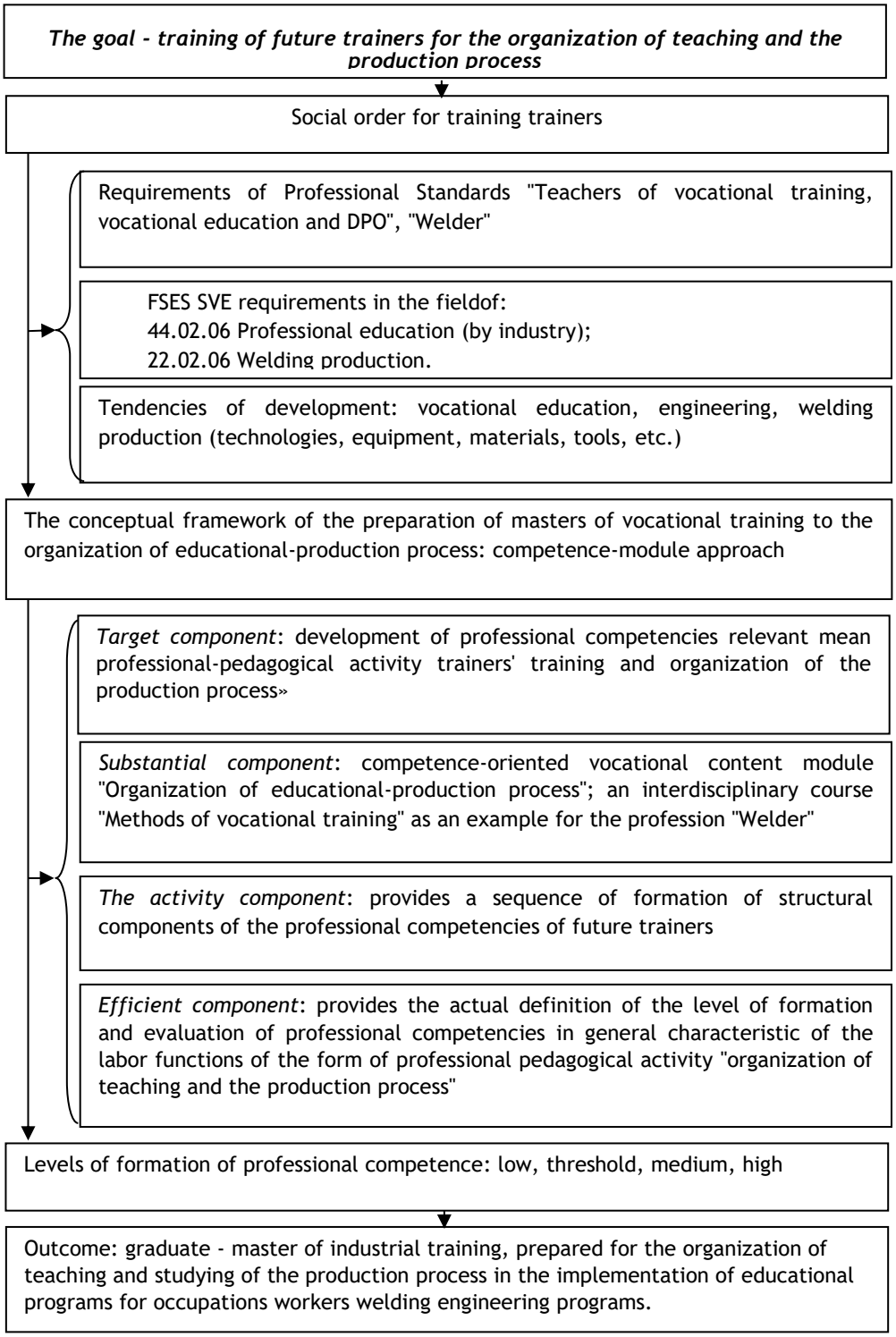

Figure 1. Structural and functional model of training future trainers for the organization of teaching and studying of the production process in the implementation of workers in occupations of educational programs

The introduction of this model suggests the next stage of experimental work:

- Definition of the initial level of formation of professional abilities of students with the use of test methods, questioning, teacher observation and self-observation faculty, statistical processing of survey results.

- Development and implementation of scientific and methodological support, contributing to the successful functioning of the structural-functional model of training future trainers for the organization of teaching and studying of the production process in the implementation of workers in occupations educational programs.

- Determination of the level and to identification of the dynamics of formation of professional competence for teaching and studying the production process in the implementation of educational programs of workers trades (Romantsev et al., 2005).

The study involved 104 people enrolled in the program of secondary vocational education on specialty "Vocational training" (specialization - Welding production). An analysis of the diagnostic results of the survey led to the conclusion that the level of assimilation of knowledge and skills that enable the organization of teaching and the production process, the students in the control group after studying their discipline methods of professional training and transmission of educational and industrial practices amounted to 8% of the students have a low level of 46 % of students have a threshold level, while the lowest level observed in the ability to apply the knowledge and skills to solve practical problems and skills of professional activity. The average level was detected in 30% of the students showed a high level of 16% of the students.

Results of the ascertaining stage of pilot search operation led to the following conclusions:

- According to the results students learning the discipline "Professional Training Technique" have insufficient level of formation of professional competence in the field of training and production process. Students are not quite ready to freely and confidently, and most importantly the right to apply the acquired knowledge and skills in their professional activity

- Control and evaluation activities showed a low level of educational and cognitive activity, lack of understanding, motivation and readiness for professional work. That confirms the existence of the gap between the conditions of the functioning of the educational environment and the real production.

Thus, the correction seems to be made in the process of training trainers to the organization of training and production activities, namely in terms of adjusting the professional module of the program content of "Organization of educational-production process" in preparing students majoring in the ACT "Vocational training" (specialization - welding production) in accordance with the requirements of the FSES SVE.

The formative phase of development and search operation involves the following tasks:

- Formation of students' knowledge systems and skills in the organization and implementation of training and production process in terms of the requirements of modern production and living conditions of specific enterprises;

- The development of professionally important qualities trainers that inherent.

The implementation process of preparation of masters of industrial training in the branch RGPPU in Berezovsky was organized by designing competence-based content MVT "Methods of vocational training" as part of the professional module "Organization of educational-production process", included in the training of mid-level structure in-depth training. Besides professional MVT module such components as the educational and industrial practice the are also important .

Based on the results of development of the professional unit, recorded in FSES SVE "Vocational training", it is worth noting that, in spite of the group nature of training masters of vocational training, the process of development of the competence-orienirovannogo content of professional module "Organization of educational-production process" in a specially organized environment characterized by elements of individual training, training targeted to the needs of specific production conditions, educational organizations.

The process of preparing masters of industrial training in the experimental groups was carried out in accordance with the model developed and implemented within the framework of network communication program with CHUDPO "Uralmash Training Center" in the manufacturing incubator.

For the implementation of the learning process was developed teaching software that meets the requirements:

- Professional standard "teachers of vocational training, vocational training and additional professional education";

- Professional standards "Welder";

- Nomenclature of welding production of PJSC "Uralmash";

- Corporate culture.

This methodological support included:

- Working program of professional module "Organization of educational-production process";

- Study guide "Psycho-pedagogical bases of vocational training";

- Workbook professional module "Organization of educational-production process";

- Interactive training course "Practice of application and adjustment of contemporary high-tech welding machines" (for example, specific equipment).

Analysis of the formation of the level of performance of professional competencies of the students after learning of the professional module "Organization of educational-production process" leads to the following conclusions:

- The number of students with a high level of development of professional competence has increased from 16% to 21%;

- 59% of students have average level;

- 15% of students showed threshold level;

- The number of students with a low level of development of professional competencies decreased by 3.4%.

Results of the analysis show a positive trend change in the level of formation of professional competence after learning the professional module "Organization of educational-production process."

To date, one of the priorities of the state policy in the field of education is the organization of a comprehensive partnership. It implies an organization and development of networking systems in the field of education, including the system of vocational education, which is being implemented by professions work programs. This fact establishes significant changes in professional and educational activities masters of industrial training, and as a result, changes in the content of training to master this activity (Dremina, Kopnov & Lyzhin, 2016).

The study of psychological and educational literature allows to ascertain the absence of specific studies on the problem of the formation of professional competencies of teaching and the organization of the production process in the implementation of educational programs for occupations of workers (for example, the profession "Welder").

Research features and content of vocational and educational activities have shown that the activity of the master of vocational training is a symbiosis of two components - the pedagogical and production process that determines standing in front of her pedagogical task of education and training for specific work the specialty of a particular production. The writings of G.E. Zborowski (1987) noted that the specifics of vocational education is the master of vocational training is organizing the learning process in the productive work in conditions and the means of material production, and this means that teaching activities must be closely linked to the production and processing. Therefore, it can be assumed that the object of activity trainers is bilateral – it is the organization of training and production process, and the students who have become highly skilled workers on a particular profession. Features, nature and structure of the professional-pedagogical activity of masters of industrial training in modern social and economic conditions, are described in the works of G.N. Zhukov (2013), according to which the master of vocational training simultaneously performs two types of functions: psychological-pedagogical and profile (industry). All of this suggests that the professional-pedagogical activity of trainers has an integrative character.

Today, the heads of industrial enterprises, especially the machine-building enterprises, face problem of shortage of modern skilled workers capable to develop and work on the new high-tech equipment. Thus, changes in the process of preparation of personnel should be reflected in the professional-pedagogical activity of industrial training masters (Tarasyuk, Palkina & Lyzhin, 2014).

Modern requirements for professional-pedagogical activity are recorded in the professional standards of teacher of vocational training, vocational training and further vocational education and are presented in the form of generalized labor functions defined for the master of vocational training and their respective job functions. Thus, from the above we can conclude that the professional-pedagogical activity of trainers is an integrative activities aimed at preparing students for the professions of workers, the development of their professional culture, to achieve a high level of professional competence in the process of vocational training in accordance with the requirements of the modern labor market. Organizing and conducting of training and production process of

teaching profession is the main task of working for a leading industrial training masters. So certain conditions should be created.

The studying and description of the model of the existing training and production process to meet the requirements of modern production, which was carried out in the study based on the analysis of in-depth interviews with experts, representatives of various large-scale enterprises of machine-building and nuclear industries of Sverdlovsk region, production activities related to staff training, allowed to introduce training Scientific and production process as a set of specially organized, focused, interrelated or interacting pedagogical interaction carried out with the necessary and adequate resources and transform the initial set of knowledge and skills of future workers in the set of competencies that meets the requirements of the process and the characteristics of the manufactured products.

Results of the analysis of modern requirements to the principal professional-pedagogical activity trainers - the organization of teaching and the production process in the implementation of workers in occupations of educational programs - revealed its structure:

- the development of software and methodological support of educational-production process;

- pedagogical supervision and evaluation of the development of the qualifications of workers, employees in the process of training and production activities of students;

- implementation of educational and productive activities of students on development of training programs for skilled workers.

Simulation of the process of training of future trainers for the organization of teaching and the production process of students working professions most advantageously carried out with the use of modular competency approach, which enables the integration of theoretical and practical training, redefining the place and role of theoretical knowledge in the development of competencies (Mikhailova, 2008).

In addition, the theoretical analysis and the experience of educational institutions to improve the content of training trainers showed that the use of the competence-modular approach in preparing students for the organization of teaching and the production process has a number of other positive aspects: the possibility of individualization of the learning process for each student on the basis of his level of knowledge, skills and previous experience, by combining the necessary modules; the ability to use the same module in several training programs; transformation as spheres labor requirements the modules can be made the necessary changes in the individual modules or program can be changed; based on various combinations of modules can generate a wide variety of courses, depending on the needs of students and their initial level (ie knowledge, skills and experience gained during the previous training or work).

Conclusion

It was found that the training of future trainers for the organization of teaching and the production process will be successful, if the formation of the relevant professional competences will be organized as a purposeful and deliberate process carried out on the basis of the developed structural-functional

model consisting of interrelated components, the implementation of these organizational pedagogical conditions: the competence-based training content; as close as possible to the real production conditions educational environment; combining dual, concentrated and problem learning technologies, as well as the implementation of the program of networking with agencies and in-house corporate training companies - representatives of the real economy.

Implications and Recommendations

The contents of this article may be useful to students in educational institutions vocational teacher education system, all types of professional and teaching staff, adapting to the new conditions of professional work in the field of education, for the education of specialists focused on designing the content of training.

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Disclosure statement

No potential conflict of interest was reported by the authors.

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