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Special Competence in the Structure of Vocational Pedagogical Integrity in the Sphere of Vocational Education

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ABSTRACT

The significance of the issue under study lies in research of the subject matter, character and components of special competences, as well as defining feasible ways of their formation in the framework of a higher vocational pedagogical institution. The article is aimed at providing the rationale for necessary formation of special competences in education for vocational teachers with implementation of Vocational and Federal State Education Standards. The main method of studying the given issue consists in pedagogical modeling of educational procedures for vocational teachers which allows it to outline the formation process of a special competence in learning specialist disciplines after determining its structure and contents. It was deemed necessary and proved to form special competence in education of future vocational teachers. The process of special training was structured with relevant amendments and supplements to its contents. On the top of it, this process of was accompanied by specially designed learning and teaching materials. The contents of the article could be of interest for graduate students and postgraduates as well as teachers who are involved in working on educational projects for vocational teachers.

Keywords: special competence of future vocational teachers, vocational-pedagogical integrity, process model for formation of special competence, didactic conditions

INTRODUCTION

The analysis based on the survey carried out among the managers of educational institutions in the system of secondary vocational education reveals that in the in present-day context of technical and informational development of production young teachers and masters of vocational education who are involved in vocational-pedagogical activities encounter difficulties with mapping educational contents to prepare their future workers. These contents are connected with acquiring cutting-edge technologies and learning to work with new equipment, not to mention modernization of technological processes and applying modern construction materials, which is explained by the insufficient level of special competence.

The significance of the research is connected with determining the subject matter, character and constituting components of special competence, as well as defining feasible ways of its formation in the framework of higher institution.

There were pointed out the following contradictions on the basis of existing psychological-pedagogical research and special literature which is focused on forming special competence of future vocational teachers:

- increased requirements on the behalf of employers and labour market for the level of vocational education of vocational teachers as opposed to its current condition;

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- between a necessity of targeted formation of special competence for future vocational teachers in the course of vocational education and insufficient theoretical and practical groundwork provided by the pedagogical science on the subject-matter, specifics and didactic conditions to form this competence successfully.

The aim of the research is to theoretically prove and develop a model of forming special competence for future vocational teachers.

The problem of defining the subject matter of vocational and special competences is of great interest for both pedagogical theory and practice. The issues of identifying the definitions mentioned above were studied by different scientists, who looked into vocational and special competences of specialists working in the sphere of education, production, economy and information technologies. Notable are the research made by the scientists who focused on the area of vocational-pedagogical education. Among those is the study by V.V. Evdokimov [1] presenting vocational-pedagogical competence of vocational training masters and offering a formation model of vocational competence in the process of learning methodological disciplines. The experience of forming basic competences among technicians in the course of learning technical disciplines was under study [2]. It is of interest to investigate the formation of special competences among students when carrying out project and research educational activities, which proves project work to be an approach to forming special competences and personality traits necessary for a today's specialist [3]. The study performed by authors L.A. Kitaeva, V.M. Murzin and P.N. Osipov [4] was of interest as it defined special competences of magisters in project and technological spheres and presented a developed general educational programme of magistrature supplemented by relevant learning and teaching materials which ensure quality education for students.

LITERATURE REVIEW

Competence approach, according to Russian scientists A. A. Verbitskiy [5], E. M. Dorozhkin and E. F. Zeer [6], I. A. Zimnyaya [7], E. F. Zeer [8] is a way to reach a new quality level of education, which in terms if vocational education will consist in matching personal, professional and social characteristics of a young specialist and daily living needs, including the needs of this young specialist, industry and society.

Therefore it seems relevant when educating vocational teachers to form specific personal qualities defined as "professional integrity" and "special competence".

Suggestive of the studies by C. Y. Batyshev [9], B. S. Gershunskiy [10], E. F. Zeer [11], A. K. Markova [12] and L. M. Mitina [13], who refer to "professional integrity" as a subjective personality feature which proves a certain level of relevant acquired competences, we address professional integrity as a complex personality resource (knowledge, abilities, skills, practical experience and personal traits system) which gives an opportunity to effectively cooperate with the outer world in some particular areas and depends on competences necessary to do so. By professional integrity we understand personal ability to do activities based on a particular set of knowledge, abilities, skills, practical experience and personal traits system.

The notion of professional integrity of a modern specialist B. S. Gershunskiy [10], E. F. Zeer [11], I. A. Zimnyaya [7], A. K. Markova [12], S. E. Shishov [14], A. V. Khutorskoy [15] not only implies the idea of a qualification (professional knowledge and skills, abilities and experience of activities), but also developed social-communicative and individual features ensuring independent professional activity.

Research of scientific literature, studying subject matter characteristics of professional integrity of a specialist as well as investigating into specifics of vocational-pedagogical activities enabled to define – pedagogical integrity of a vocational teacher as an integrating personal quality based on a set of vocational-pedagogical knowledge, practical abilities and skills proving specialist expertise in vocational-pedagogical activities [16].

Vocational-pedagogical integrity consists of competences which are realized through doing vocational-pedagogical activities and have a componential structure which is dependent on creative comprehension of activities.

A set of specialist competences is on the one hand predetermined by the main "customers" of vocational education system (employers, the state and the society), and on the other hand by the educational system and a student himself as being a future specialist. Employers, the state and the society do not belong to the education system, but it is them who eventually estimate the quality of vocational education, namely the practical application of specialist academic background. A high level of professional integrity is of primary importance for employers due to proving the ability to effectively and practically function as a specialist and a problem-solver in a certain sphere [17].

METHODOLOGICAL FRAMEWORK

In this study, the following methods were used: theoretical (analysis and conceptual synthesis of ideas set out in scientific sources on psychological-pedagogical issues of teachers' vocational education; pedagogical modeling; synthesis; generalization).

Research and Trial Basics of the Study

The research and trial resource for the study are represented by Russian State Vocational Pedagogical University, institutions of secondary vocational education system in the city of Ekaterinburg; among them are higher vocational school # 66, higher vocational school # 94, machine engineering plants of Ural region: JSC "Uralmashplant", JSC "Urals Pipe Works" (Uraltrubprom); OOO Severouralskiy zavod ZHBI, OOO Boksitstroy.

Stages of Research

The research of the issue was accomplished by two stages:

- the first stage involved studying psychological-pedagogical and special literature, regulatory documentation, pedagogical experience, theory and practice of teaching basic and technical disciplines, which is stipulated by necessary formation of special competence of future vocational teachers in the context of new economic conditions. As a result of the study there was selected and theoretically grounded the topic under study; conceptual framework was developed; a problem, hypothesis, aim and objectives for the programme of research were stated; the search of approaches and effective ways of organizing and managing the formation process of special competence for future teachers in the sphere of vocational education was brought about.
- the second stage was devoted to specifying the main guidelines of the study, developing a model of a special competence for future vocational teachers, identifying didactic conditions of applying it in the course of vocational training and teaching special disciplines.

RESULTS

The Contents and the Subject Matter of Components Making Up Special Competence of a Future Vocational Teacher

Based on analyzing the results of a survey carried out among managers and psychological-pedagogical workers throughout the system of SVES (Secondary Vocational Education System), componential contents of professional integrity for vocational teachers was identified. The necessity to form one was noted unilaterally by all the respondents. Professional competence of vocational teacher included the following competences in the order of priority: special (80%), pedagogical (68%), social-communicative (61%), didactic-technological (48%), informational-analytical (36%), and innovative (31%). We refer *special competence of future* vocational *teachers* as an integrating personal quality of a specialist which proves his expertise in applying a set of engineering and technological knowledge and skills of a particular industry in the process of vocational of workforce, demonstrating such professionally important qualities as technical thinking, creativity, enthusiasm, and independence [18].

Analyzing the subject matter of engineering and technological activities of a vocational teacher in the profilisation "Technologies and technological management in welding industry", employers' requirements, labour market and modern tendencies of machine engineering production revealed a variety of components constituting special competence content: theoretical-technological, design-and- constructive, technological, organizational-functional, operating-professional (**Figure 1**).

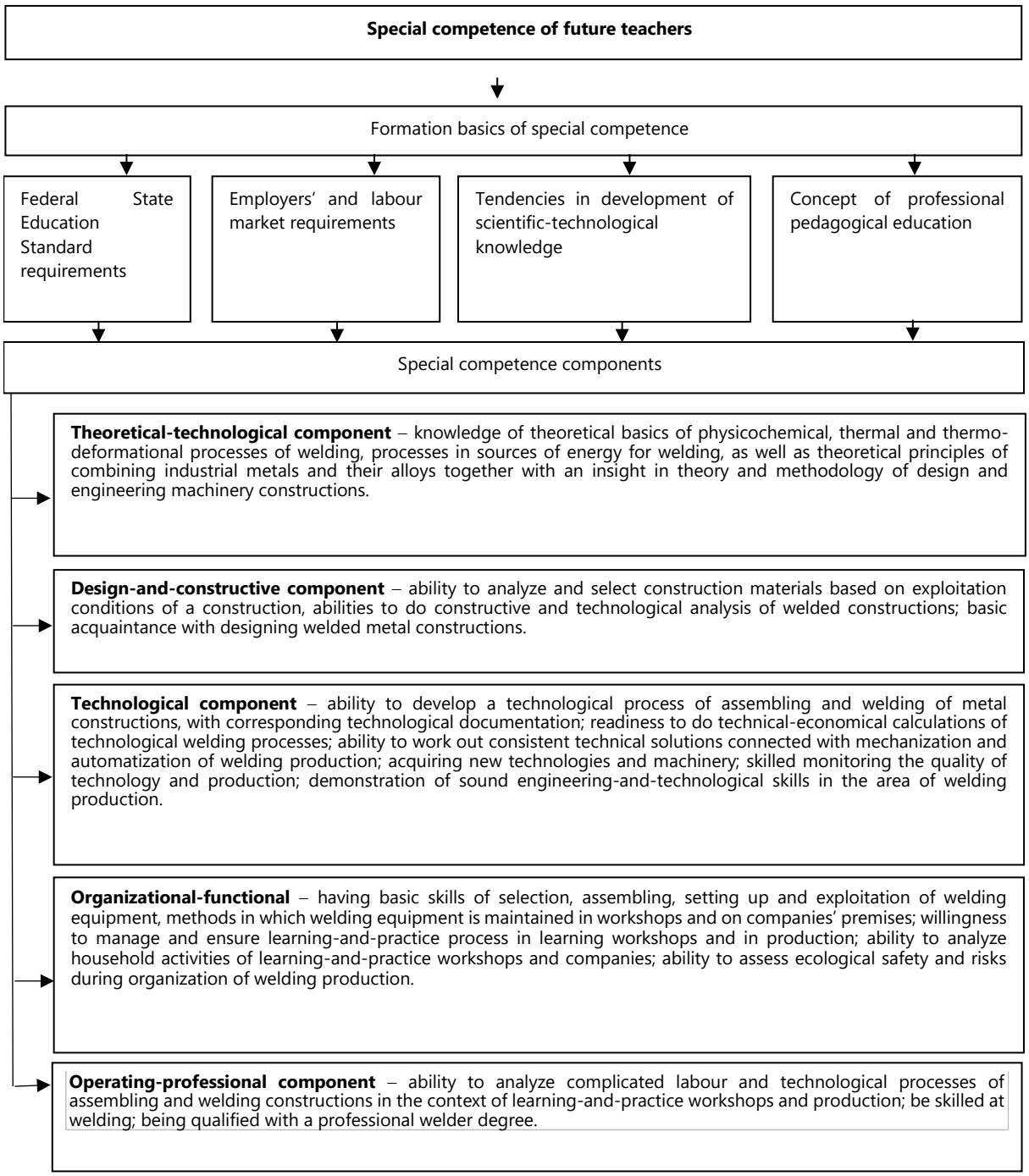

Figure 1. Componential scheme of special competence for future vocational teachers

Forming special competence of future vocational teachers in the profilization "Technologies and technological management in welding industry" is carried out through learning special disciplines, the discipline "Practical training on a specialty" and during qualification practice sessions for a job and a technological practice.

Specialty disciplines play an important role in preparing future vocational teachers for vocational-pedagogical activities. The objective of learning these disciplines is to form a system of operational-technological knowledge in the sphere of welding production, to develop technical thinking, constructive technological abilities, to master skills of problem-solving as is comes to certain technological or production tasks giving an deep insight into modern production processes. Moreover, as long as they refer to the area of engineering knowledge necessary for future vocational-pedagogical activities when teaching workers, the contents of such disciplines for special preparation is supposed to have a specific character which is determined by their pedagogical focus [19].

Designing a Model of a Process of Special Competence Formation

The analysis of theoretical and methodological approaches of how to form special competence of future vocational teachers and their distinctions determined by the context of learning special disciplines proved it to be necessary to design a model of special competence formation. The application of such a model, on condition that all didactic guidelines are complied with, will ensure integrity of pedagogical impact on personality of a future vocational teacher and develop his professionally relevant personal traits [20].

By a model as it was suggested by V. A. Shtoff [21] we mean a system visualized mentally or a materially applied one which is able to provide new information on the object under study, reflecting or reproducing it.

The result of scientific research was stipulated by a concept based on several approaches: competency-based one by V. I. Bajdenko [22], V. A. Bolotov and V. V. Serikov [23], E. F. Zeer [11], E. F. Zeer [8]; I. A. Zimnyaya [7], V. D. Shadrikov [24], S. E. Shishov [14], system approach by V. G. Afanasyev [25], V. P. Bespalko and Yu. G. Tatur [26], E. G. Yudin [27], activity approach by A. N. Leontiev [28], S. L. Rubinshtein [29], V. A. Slastenin, I. F. Isaev and E. N. Shiyanov [30], A. V. Khutorsoy [15] and learner-centered approach by I. S. Yakimanskaya [31]. Their complementary application ensures organizational complexity and effectiveness of special competence formation [17].

The application of the system approach for designing special competence formation in the course of learning vocational discipline accounts for its consistency, building logical and system connections between its structural components, and defining concessive and functional meaning of both the components and the process on the whole [32].

Competency-based approach suggests the substitution of essential formation of knowledge, abilities and skills by a complex of competences – new subjective qualities acquired by a student which are formed on the basis of activity and learner-centered contents of education.

The activity approach refers to a global central part of any educational system, namely to personality development in the unity of its intellectual, emotional-volitional and personality traits. Applying this approach demonstrates humanistic orientation of a person's competence formation, which relies on organizing subjective functions of education where a personality is referred to as a subject of the activity that forms itself in this activity, determines its character and regulates it.

The learner-centered approach ensures independent development of a student, his personal self-fulfillment in learning activities. An educational process which is based on the learner-centered approach not only places a learner in the center of the educational process as the subject of teaching activities, but also designs the educational process on the basis of subject-object interactions, giving the learner a chance to take an active position in the learning process. The education is thus refracted through personality of a learner, his motives, value systems, goals, cognitive interests, professional prospects, etc.

The aim of forming special competence in a future vocational teacher by special disciplines is to create conditions for forming personality of a competent vocational teacher who is efficient in teaching workers and applying basic theoretical knowledge of designing, construction and technology of welding production, a skilled and qualified as a "Welder" worker, professionally flexible and motivated to get ahead in his career.

Investigating special competence formation among future vocational teachers, we rested upon the structure of the educational process which consists of the aim, contents, methods and techniques.

The model of special competence formation in the process of learning special disciplines includes a set of the following components: motivational and goal-oriented, informational-contensive, activity-and-processual, reflexive-evaluative, and diagnostic-correctional [33]. Each component has got a special aim, objectives, suggests using certain methods and techniques of educational process, fulfilling at the same time their functions (**Figure 2**).

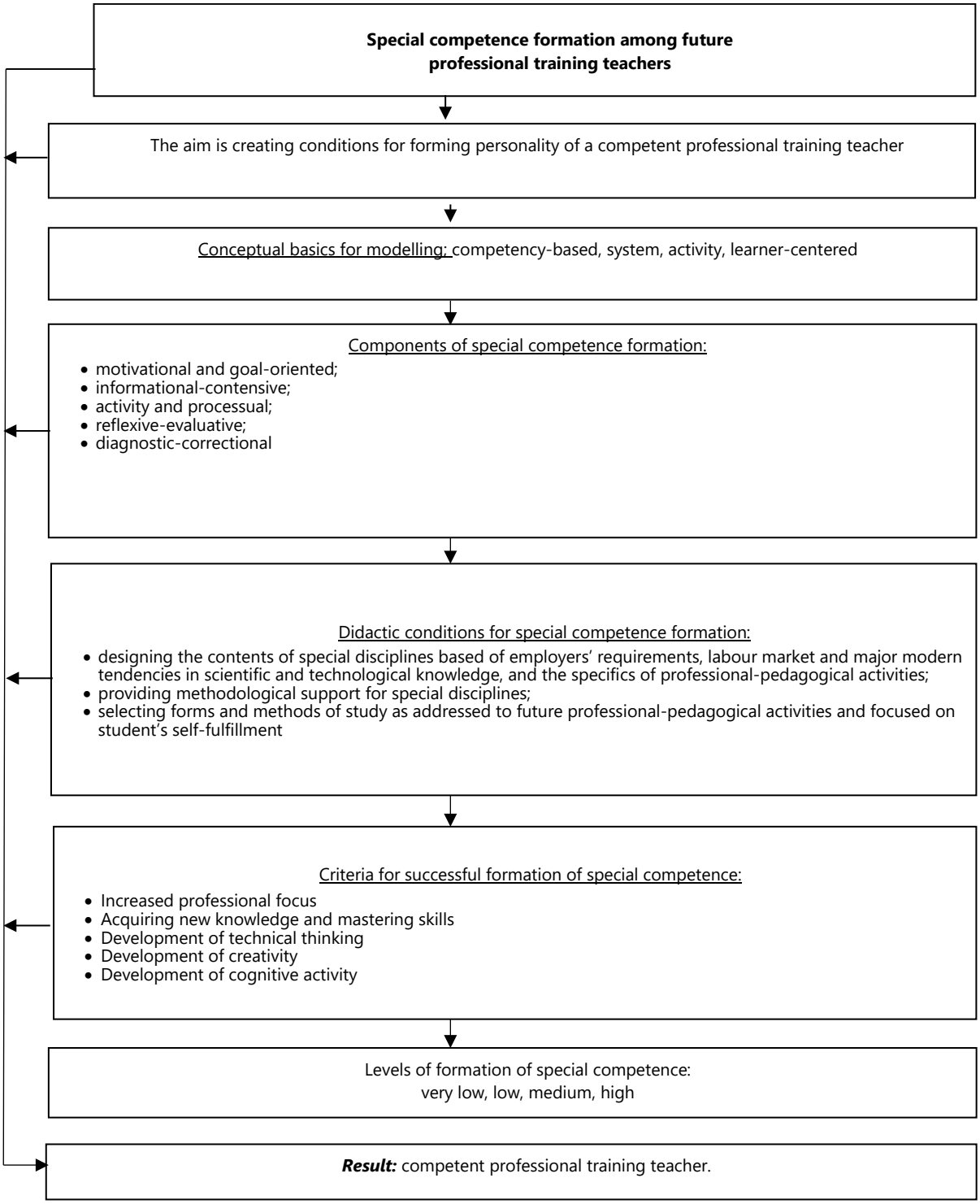

Figure 2. Model of special competence formation in the process of studying special disciplined

Motivational and goal-oriented component is aimed at developing stable cognitive motivation towards learning and future vocational-pedagogical activities. This component is actualized through a combination of a momentum, intentions, personal preferences, goal settings and is supposed to form subjective socio-professional attitude of a future vocational teacher, which stipulates the formation of vocational-pedagogical orientation implying a conscious bias for vocational activities.

Informational and contensive component means acquiring the whole system of knowledge and skills which is built on integration of science and engineering knowledge used in the area of welding when designing technologies

of welding construction production. Knowledge of theoretical basics of welding contributes to optimum selection of welding methods, the necessary conditions for producing a welding joint with required working properties.

In the process of special competence formation, activity and processual component aims at development of technical thinking, designing, research, technological skills in the field of welding production, as well as creativity, independence and enthusiasm. It could be achieved through applying relevant forms, methods and tools for special competence formation of future vocational teachers. According to the approaches stated above, we focused on those teaching methods that, on the one hand, give an opportunity to organize a multi-level, diverse and productive learning-and-cognitive students' activity, which fully employs his potential abilities and skills thus serving, in its turn, to consolidate cognitive and professional needs and acquiring methods of activity; on the other hand, take into account subjective experience of every student, his individual personality traits, build subject-subject relationships in learning process so that both the student and the teacher were equal partners.

Reflexive and evaluative component gets students involved in self-evaluation and self-analysis of learning activities in the process of learning special disciplines. Development of a reflexive function is demonstrated by the ability to comprehend individual learning activities, to adequately estimate it. In doing so, a student concentrates his attention on both acquired knowledge and the structure of the activity itself, which to creating "products" of learning. Students come to be aware of their own effective ways of acquiring knowledge, form individual learning methods – a complex characteristic which includes some meaningful individual traits in students, for personality development and acquisition of knowledge [33].

Diagnostic and correctional component expects students to form diagnostic skills which include self-control of learning activities, level of personal development and personal abilities and opportunities based on timely acquisition information about results of learning activities and reflecting. Such information will help to independently adjust own activities and develop the ability for self-regulation [33].

The distinction of the developed model of forming special competence of future vocational teachers alongside with learning special disciplines consists in systematization and integration of the examined components. This ensures consolidated orientation of educational process towards forming a competitive and professionally flexible vocational teacher.

The research stated that successful application of formation model of special competence in learning special disciplines is contributed by the following didactic conditions: 1) designing the contents of special disciplines is carried out to meet the needs of employers, labour market, general tendencies in development of science-and-engineering knowledge and specifics of vocational-pedagogical activities; 2) forming special competence of future vocational teachers in the process of learning special disciplines is supported by relevant methodological materials, actively used in educational process; 3) forms and methods of teaching are selected as relevant for future vocational-pedagogical activities and students' self-development.

DISCUSSIONS

The peculiarities of vocational-pedagogical activities were examined in studies by: S. Y. Batyshev [9], E. F. Zeer [11], N. S. Glukhanyuk [34], P. F. Kubrushko [35], G. M. Romantsev [36], G. M. Romantsev and N. V. Ronzhina [37], E. F. Zeer [8] , E. M. Dorozhkin, and E. F. Zeer, [6], V. A. Fedorov, and N. V. Tretyakova, [38]. V. A. Fedorov and N. V. Tretyakova [39], V. A. Fedorov [40]. Scientists believe the success of vocational-pedagogical activities is only possible when their pedagogical, engineering and manufacturing components are interconnected.

Competent performance of vocational-pedagogical activity in case of possible changes in manufacturing character of work done by a worker, and as a result of science and technical progress, will be based on those methods of activities which are formed by education of vocational teachers [41, 42]. The formation of special competence among vocational teachers is achieved primarily through applying a model of process of special competence formation in learning special disciplines.

The model of special competence formation among future vocational teachers in the process of learning special disciplines is implemented through systematic complex application of components of the given model. This is achieved through focused monitoring of teaching process including competence and activity goal-setting on behalf of the both – the teacher and the student; amendments in the contents of a discipline as specifically required by employers, labour market and tendencies in development of welding production; selection of forms, methods, teaching tools contributing to reinforcement of students' learning activities targeted at forming professionally important traits of his personality, and having vocational-pedagogical focus achieved though integration of technical and pedagogical knowledge. The specifics of process of special competence formation among future vocational teachers and identified didactic conditions of its successful implementation consists of a continuous opportunity to comprehensively consider, monitor and modify the factors which influence students' learning-cognitive activities, pay attention to the development of personal qualities, contribute to achieving a high level of such professionally important qualities as technical thinking, creativity and cognitive activities.

Therefore, the development and implementation of formation model of special competence among future vocational teachers, built on the basis of system, competence, activity and personality-oriented approaches, as well as didactic conditions, will contribute to an increasing level of special competence among future vocational teachers.

CONCLUSION

The significance of the issue of special competence formation among future vocational teachers accounts for the requirements of employers and labour market towards the level of baseline competency certification as compared to the existing insufficient level of special competence among students in higher schools.

Special competence makes a major part of professional competence of a vocational teacher and represents an integrated personal quality of a specialist, reflecting his ability and willingness to apply a complex of engineering and manufacturing knowledge and skills of a particular industry in the process of vocational teaching workers, at the same time demonstrating such professionally relevant qualities as technical thinking, creativity, enthusiasm and independence. As a result of research there were identified several structural components of special competence of future vocational teachers: theoretical-technological, design-and-constructive, technological, organizational-functional, operating-professional.

Of prior importance are such theoretical-methodological approaches of forming special competence among future vocational teachers as competence, system, activity and personality-oriented ones. They underlie the formation model of special competence including five interconnected parts: motivational and goal-oriented, informational-contensive, activity-processual, reflexive-evaluative, and diagnostic-correctional.

Didactic condition were identified for implementing this formation model of special competence in learning special disciplines which include adjusting the contents of the given discipline to the requirements of employers, labour market, general tendencies in development of scientific-technological knowledge, the specifics of vocational-pedagogical activities; creating relevant methodological materials to support the formation of special competence in the context of learning special disciplines, which is extensively used in the educational process; the selection of forms and methods of learning, taking into account particular features of future vocational-pedagogical activities and the focus on a student's self-improvement.

The following criteria were identified as the levels of special competence of future vocational teachers in the course of learning special disciplines: the level of professional orientation, acquisition of knowledge and skills, development of technical thinking, creativity, cognitive activity.

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