

## The Structural and Functional Model of Development of Profession-Oriented and Specialized Competences of Students at Vocational and Pedagogical Higher Educational Establishments

Boris N. Guzanov<sup>a</sup>, Olga V. Tarasyuk<sup>a</sup>, Svetlana A. Bashkova<sup>a</sup>, Daria A. Ustakova<sup>a</sup> and Svetlana I. Sotskova<sup>b</sup>

<sup>a</sup>Russian State Vocational Pedagogical University, Ekaterinburg, RUSSIA; <sup>b</sup>Samara State University of Economics, Samara, RUSSIA

### ABSTRACT

The topicality of the problem under study is based on requirements of the society and the shortage of teachers of vocational education on the labour market, aimed at successful vocational and pedagogical activities by means of the needed level of development of profession-oriented and specialized competences through self-development and self-fulfillment by doing vocational and pedagogical tasks. The aim of the article is to draw up a structural and functional model of development of profession-oriented and specialized competences of students during the studying of profession-related disciplines and to test this model. The leading method to study this problem is pedagogical modeling, enabling us to consider this problem as the process of development of profession-oriented and specialized competences through self-development and self-fulfillment by doing vocational and pedagogical tasks. The article outlines the structural and functional model of development of profession-oriented and specialized competences of students while studying profession-related disciplines, consisting of interconnected components: purpose-oriented, theoretical and methodological, informative, organizational and activity-related, assessment and adjustment, and performance-related; an algorithm to introduce this model was also developed. The results of the study contain the invariable foundation of methodological support of profession-oriented disciplines and can be recommended for use for the entire range of educational disciplines for profilisation. The practical significance to control professional development of students is proved by the factual material illustrating qualitative changes in their need in self-development of professional abilities.

### KEYWORDS

Competence, profession-oriented and specialized competences, specifics of training of teachers of vocational education, structural and functional model

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**CORRESPONDENCE** Svetlana A. Bashkova ✉ bashkovas@rambler.ru

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## Introduction

The structural instability, increasing on the labour market in the last years, proves that there are problems relating to interaction between the education system and employers, lack of measures to regulate demand and supply of workforce (Zakirova & Gilmiyarova, 2016; Zakirova & Purik, 2016). There is also a problem in training of workers to meet economic requirements. In modern conditions, the labour potential is becoming a key factor which is forming the foundation for qualitative changes in the national economy. It became an economic vector which enables us to concentrate on the dynamic and advanced development of the education system (Simonova et al., 2016; Sakhieva & Kuvaldina, 2016).

The modern period of development of the higher education system in Russia is accompanied by serious structural and meaningful changes, in which the training of specialists based on competence-oriented education is the main distinctive feature (Kayumova & Zakirova, 2016). The competence-based approach is aimed at achieving new quality of education. It includes socially founded requirements to education results and organization of an education process depending on a specific profilisation of training. Implementation of education in such conditions encourages the creation of situations and performance of actions which can lead to the forming of required competences and behavior models (Tatur, 2004).

The process of forming expertise of a specialist is rather complex and diverse, which is connected with acquisition of competences different in areas and professional manifestations. In connection with this, it should be pointed out that professional expertise is not a natural innovation and demands planning of a special training system, performing the functions of education, development and upbringing. As a result, expertise is person-determining and it should be understood as an integral feature which can be divided into separate competences, forming the competence-based model of a graduate of a higher educational establishment. In particular, the structure of a professional and pedagogical competence of a teacher of vocational education can be presented as a set of pedagogical, didactic and technological, reflexive, social and communicative, production and technological competences, guaranteeing the effectiveness of his organizational and technological activities and training of employees at learning and practice classes or companies (Guzanov & Krivonogova, 2011; Sakhieva & Fedorova, 2016).

In such a structure a set of competences for one training programme can be the same for all students apart from specialized, which coincide with specialization related to the program. Taking into account the aforementioned information, we will understand profession-oriented and specialized competences of a teacher of vocational education (Bashkova & Tarasyuk, 2010) as part of his professional and pedagogical expertise, which is a set of integrative professional knowledge, skills and personal qualities acquired amid a holistic educational and professional process of theoretical and practical training.

It should be noted that you can develop such competences only when the dominant role in the process of education is given to subject activities, which is directly connected with acquiring working knowledge, including labour skills at the level of a future profession. Taking this into account, as it is shown in the work N.V. Rozhnina (2015), the implementation of the competence-based



approach is based on a concept of competences as the foundation for developing students' abilities to resolve practical tasks. To achieve this, one should use the method of competence planning, based on a theory of professional setting of goals. Using this method, we can improve education goals, depending on the level of the social and economic development of the society and demands of the labour market, as well as prove the choice of means, methods and forms of organizing an education process to achieve the required quality of a graduate's training.

Analyzing the nature and content of activities of a teacher of vocational education functionally, we can define his work as a specific kind of activity the result of which is to train qualified employees for different branches of industry and to form applied qualifications. All this activity is inextricably connected with the development of modern equipment and high technologies, which is setting new requirements to the profession-oriented and specialized competences of future teachers of vocational education. As a result, vocational and pedagogical higher educational establishments are forced to amend and in some cases to change the content of integrative structural components of training of students, which act as the industry-based, psychological and pedagogical, training to a future profession.

The country has a huge positive experience in training of teachers for vocational education. For many years the Russian State Vocational Pedagogical University has been the scientific and training centre studying this problem. The university works under the scientific supervision of a member of the Russian Education Academy G.M. Romantsev (Romantsev, 2007; Fedorov & Khamaturov, 2010; Ronzhina et al., 2016). The reflection of this activity made the authors to analyze the existing and to plan a new methodology of vocational and pedagogical education (Dorozhkin & Zeer, 2014).

Making the competence planning of content to train teachers of vocational education at the Russian State Vocational Pedagogical University for a training programme "Vocational education (by branches)" for profilisation "Certification, metrology and quality control in the machine-building industry", using the example of a discipline "Devices and machines for controlling accuracy and quality", such profession-oriented and specialized competences (PSC), needed for their future professional and pedagogical activities, were determined (Bashkova & Tarasyuk, 2011).

## **Materials and methods**

### ***Research methods***

The following methods were used to carry out the research: theoretical: analysis of pedagogical, psychological and methodical literature, analysis of professional and educational standards, educational and programme documents relating to training of teachers of vocational education; empirical: questionnaire, observation, conversation, analysis of performance results, experimental and searching work and statistical methods to analyze results.

### ***Experimental resources of the research***

Experimental and searching work was carried out at the Russian State Vocational Pedagogical University; organizations, implementing programmes for training regular labour force: Yekaterinburg industrial and engineering

technical school; Yekaterinburg machine-building college of the Russian State Vocational Pedagogical University; at centres for training employees for machine-building companies in Yekaterinburg, namely Uralmashzavod, and Kalinin Machine-Building Plant. A total of 228 people, 25 teachers and 203 students, took part in the study.

### ***Research stages***

The problem was studied in three stages:

The first stage focused on making a summary of the problem in psychological and methodical literature, studying the problem in the pedagogical theory and practice, determining the essence, specifics and structure of profession-oriented and specialized competences, studying the content of a profession-related discipline, finding ways of planning the content of a profession-related discipline and determining the methods of experimental and searching work.

The second stage was dedicated to choosing approaches to planning the content of a profession-related discipline at a higher educational establishment, singling out profession-oriented competences to be developed in students during the studying of a given profession-related discipline, drawing up of the structural and functional model to develop profession-oriented competences of students of a higher educational establishment, determining didactic conditions to develop profession-oriented competences.

The aim of the third stage was to introduce the competence-based content of a profession-related discipline, structural and functional model to develop profession-oriented and specialized competences of students of a higher educational establishment, didactic conditions to develop profession-oriented and specialized competences. The main ideas of the hypothesis were checked; the competence-oriented content of a profession-related discipline was tested by experiment.

## **Results**

### ***Structure and content of the model***

To prove the structural and functional model to develop profession-oriented and specialized competences of students during the studying of a profession-related discipline (Figure 1) we used a set of complementary approaches, the choice of which is based on need to determine the content of structural components of the model and the result of its functioning.

The system approach is primary one for building the model. It makes it possible to present the process of development of profession-oriented and specialized competences (PSC) as a holistic pedagogical system, to single out its structural and functional components taking into account their additions and interrelations.

In compliance with the competence-based approach, education results can be measured with the help of competences in the form of knowledge, skills, abilities and values which are needed for a future profession.

Using an activity approach, we can organize and control the education of students of a vocational and pedagogical higher educational establishment by forming specific abilities and personal qualities, making a person part of an



active, meaningful and valuable for him educational activity, reflecting specific features of vocational training.

The aim of a person-centered approach is to develop personal potential of a student, but not only his ability to acquire knowledge and skills. A student is an active subject of a teaching process, developing and implementing his potential, the main point of which is to solve problems, defining individual needs, abilities ensuring the development of profession-oriented and specialized competences.

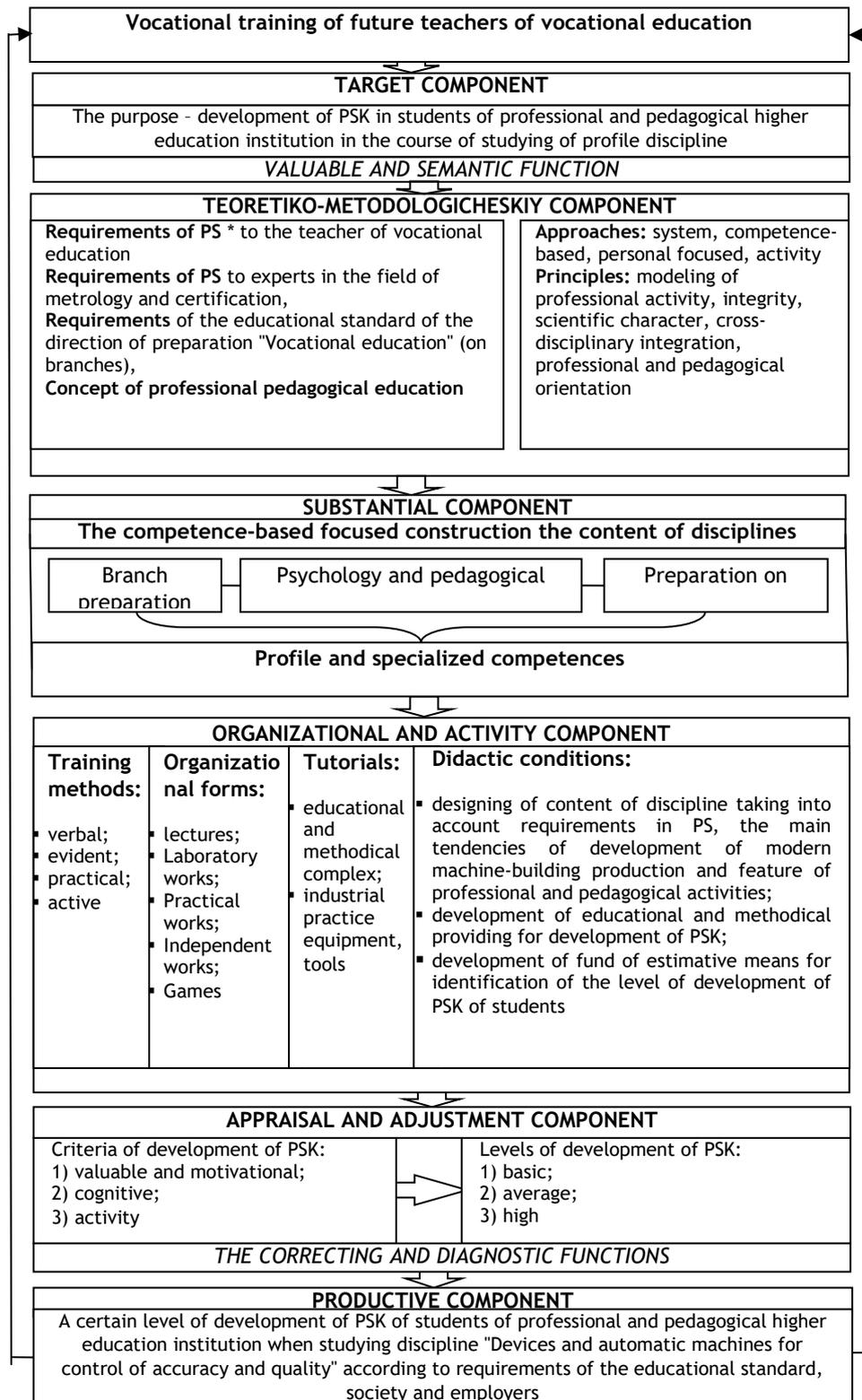


Figure 1. Model of development of profession-oriented and specialized competences (PSC)



during the studying of profession-related disciplines (\*PS - Professional Standards)

The worked out structural and functional model to develop profession-oriented and specialized competences of students is based on coordination and mutual subordination of components, such as purpose-oriented, theoretical and methodological, informative, organizational and activity-related, assessment and adjustment, and performance-related. Each component performs some specific functions, guaranteeing integrity of the model as a system.

The purpose-oriented component determines the purpose of a model to develop profession-oriented and specialized competences, as well as the content and structural ties of its components.

An important function of the given competence is its value and meaning function, which makes it possible to forecast the training results of future teachers of vocational education, as well as regulate and adjust training to achieve a high level of development of profession-oriented and specialized competences.

The theoretical and methodological component includes initial theoretical ideas, reflecting the chosen approaches and the system of principles, as well as requirements to graduates of vocational and pedagogical higher educational establishments, mentioned in relevant regulatory documents.

The informative component of the model reflects the acquiring of the holistic system of knowledge and skills as descriptors of profession-oriented and specialized competences, built of the basis of integration of natural-science and production and technical knowledge. The analytical and forecasting function of this component is to discover profession-oriented and specialized competences, in its vocational and pedagogical field, professionally significant qualities and to determine the content of a profession-related discipline, which should be learnt at the stage of professional training.

The organizational and activity-related component of the model ensures the gradual development of components and implements the organizational and forming function. The role of the organizational function is in competence planning of a training process for a profession-related discipline according to set goals and training principles, determining reasons for methods, forms and training tools. The role of the forming function is to develop profession-oriented and specialized competences needed for professional and pedagogical activities.

Case-study is one of the most effective pedagogical technologies for developing profession-oriented and specialized competences. Using it, we can develop intellectual potential of students, form their progressive style of thinking, ethics and professional focus on professional and pedagogical activities.

Educational and industrial equipment, materials, instruments and teaching materials of a discipline can be used as training tools. The teaching materials consist of interconnected components such as a working programme of a discipline; tasks and methodical guidelines to do laboratory and practical works; tests to check initial, intermediate and final knowledge; documents to hold Olympiads and role games; tasks and methodical guidelines to do individual work.

Observing specially created didactic conditions, organizing the education activities, we can ensure good results of functioning of the suggested model of development of profession-oriented and specialized competences.

The assessment and adjustment component of the model allows us to determine the level of profession-oriented and specialized competences among students, as well as control and assess students' activities. It envisages the development of evaluation tools fund, which comprises questions to practical and laboratory works, topics of reports for individual work, tests on a programme topics to assess students' performance, case-study, tasks for Olympiads and role games, final questions for an exam.

The performance-related component of the model is presented as a specific level of development of profession-oriented and specialized competences of students at a vocational higher educational establishment during the studying of a profession-related discipline in compliance with the social and economic development of society and labour market requirements.

Thus, the suggested structural and functional model of development of profession-oriented and specialized competences of students at a vocational and pedagogical higher educational establishment reflects the main tendencies of the modern training system and can be used as a foundation of a learning and teaching process to form readiness of students for professional and pedagogical activities (Guzanov, Tarasyuk & Bashkova, 2016).

### ***Stages of introducing the model***

The introduction of the given model passed through the following stages:

1. Studying of the problem in the modern pedagogical theory and practice of vocational education, revealing of tendencies, consistent patterns, contradictions in the process of development of profession-oriented and specialized competences of students learning profession-related disciplines at a higher educational establishment, determining of initial reasons for the study.

2. Producing of scientific grounds and development of structural and functional model of development of profession-oriented and specialized competences during the studying of a profession-related discipline.

3. Determining of didactic conditions to implement the model of the process of development of profession-oriented and specialized competences during the studying of a profession-related discipline.

4. Using the experimental and searching work, to check the performance of the structural and functional model of development of profession-oriented and specialized competences of students during the studying of a profession-related discipline.

### ***Stating stage***

The stating stage was dedicated to discovering the initial level of development of profession-oriented and specialized competences of students in control and experimental groups before the studying of a profession-related discipline. The students were taught gradually and the level of development of profession-oriented and specialized competences of each student was checked before and after the studying of a discipline. The result of the zero test showed that the students in the control and experimental groups began studying a



discipline practically at the same level of knowledge (the coefficient of acquiring educational material is  $\geq 0,7$ ), the task was done by 32,0 % of students in the control group and by 30,6 % in the experimental groups. The results of a questionnaire among teachers of centres for training employees and organizations of secondary vocational educations showed that 58,7 % of teachers have problems with professional and pedagogical activities while teaching employees and middle-level specialists for a relevant branch. This proves that students of vocational and pedagogical higher educational establishments should develop profession-oriented and specialized competences. The results of a questionnaire among students revealed that 56,3 % of students in the control group and 60,1 % in the experimental ones are interested in a profession-related discipline; they should gain knowledge and skills relating to profession-related disciplines in compliance with requirements of the Federal State Educational Standard of higher education and professional standards to be competitive specialists. The results of the stating stage proved that the structural and functional models and didactic conditions of development of profession-oriented and specialized competences of students of a vocational and pedagogical higher educational establishment should be introduced to the process of education.

### ***Forming stage***

Traditional forms, tools and teaching methods without use of didactic conditions were used to organize the studying of a profession-related discipline in the control group at the forming stage of the research. In experimental groups (EGs-1, EGs-2, EGb-3) a profession-related discipline was studied according to the structural and functional model of development of profession-oriented and specialized competences of students of a vocational and pedagogical higher educational establishment in different combinations of didactic conditions. The introduction and testing of didactic conditions in the experimental groups was gradual.

In EGs-1 we used the competence-oriented content of a discipline, included in the learning and teaching provision of a profession-related discipline, taking into account requirements of the labour market and employers, the main areas of development of the modern machine-building sector and specific features of professional and pedagogical activities.

In EGs-2 and EGb-3 we used the competence-oriented content of a discipline, included in the learning and teaching provision of a profession-related discipline, as well as the developed evaluation tools fund to assess the level of development of profession-oriented and specialized competences of students during the studying of a discipline.

### ***Control stage***

The dynamics of the level of development of profession-oriented and specialized competences of students was determined at the control stage of the research, the students' learning activity and results of their work were analyzed.

Analyzing the results of the zero and final tests (Table 1), we can make a conclusion that students of a vocational and pedagogical higher educational establishment in the experimental groups showed an increase in the level of development of profession-oriented and specialized competences, compared to the control group.

The numbers show positive changes in the level of development of profession-oriented and specialized competences of students in the experimental groups EGs-1, EGs-2 and EGb-3. The final test showed positive results of the work done: the number of students with the basic level of development of profession-oriented and specialized competences went down in all groups; the number of students with the average and high levels of development of profession-oriented and specialized competences went up demonstrating positive dynamics.

**Table 1.** The development of profession-oriented and specialized competences of students of a vocational and pedagogical higher educational establishment depending on a level

Level of development of PSK, %	Group											
	CG			EGs-1			EGs-2			EGb-3		
	Zero cut	Total cut	Change									
Basic	56,6	47,4	-9,2	58,9	19,6	-39,3	62,7	16,2	-46,5	57,8	20,2	-37,6
Average	37,3	42,4	+5,1	34,3	53,2	+18,9	30,9	54,1	+23,2	35,7	52,5	+16,8
High	6,1	10,2	+4,1	6,8	27,2	+20,4	6,4	29,7	+23,3	6,5	27,3	+20,8

Note - Changes with the «+» sign mean an increase in the number of students and with the «-» sign mean a decrease.

The total evaluation of the development of profession-oriented and specialized competences of students depending on levels is presented in table 2 (where  $\bar{X}$  is the arithmetic average of a set of measurements, Dij is dispersion and Temp is an empiric value of Welch's test) and the histogram (Figure 2).

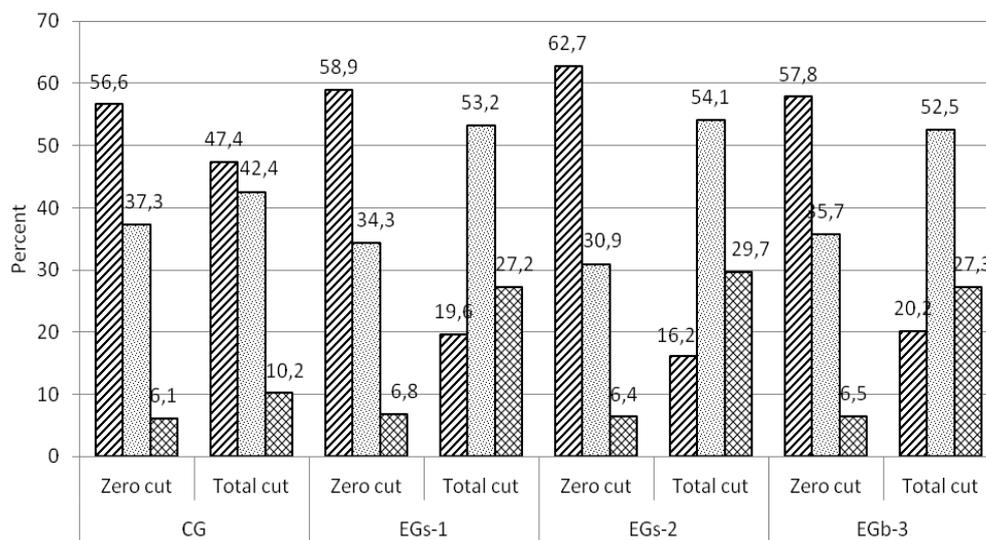
**Table 2.** The comparative analysis of results of development of profession-oriented and specialized competences of students at a vocational and pedagogical higher educational establishment

Group	Zero cut			Total cut			Temp	
	Maximum point	$\bar{X}$	Dij	Maximum point	$\bar{X}$	Dij		
basic level								
CG	3	3,72	0,27	4,67	3	4,33	0,28	5,83
EGs-1	3	3,36	0,26		3	3,84	0,25	
EGs-2	3	3,26	0,25		3	3,56	0,23	
EGb-3	3	3,32	0,26		3	3,62	0,25	
average level								
CG	5	3,67	0,38	2,02	5	3,97	0,62	2,27
EGs-1	4	3,45	0,15		4	3,67	0,34	
EGs-2	5	3,36	0,23		4	3,60	0,20	
EGb-3	5	3,41	0,19		4	3,63	0,27	
high level								
CG	5	3,60	0,07	0,36	5	3,94	0,37	2,03
EGs-1	5	3,49	0,01		5	3,79	0,35	
EGs-2	5	3,44	0,02		5	3,59	0,29	



EGb-3	5	3,45	0,03	5	3,64	0,32
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The results of calculations by Welch's test to assess the level of development of profession-oriented and specialized competences of students of a vocational and pedagogical higher educational establishment during initial and final tests showed that the control group (CG) and the experimental groups (EGs-1, EGs-2 and EGb-3) became statistically different by the end of the experimental and searching work; the certainty of the difference is 95 %. It means that the distribution of students by levels of development of profession-oriented and specialized competences is not accidental and the suggested set of didactic conditions of the model of development of profession-oriented and specialized competences affected the aforementioned competences.



**Figure 2.** The dynamics of development of profession-oriented and specialized competences of students:

▨ – basic level; ▤ – average level; ▩ – high level.

All this points to the fact that the use of didactic conditions and the structural and functional model of development of profession-oriented and specialized competences of students of a vocational and pedagogical higher educational establishment during the studying of a profession-related discipline is effective and can be used as a foundation of the learning and teaching provision to train students at a higher educational establishment for their future professional and pedagogical activities.

## Discussions

According to a programme for the development of education in 2013-2020, the Russian Federation authorities are pursuing a state policy aimed at forming

applied qualifications and training regular labour force, which is being implemented on the basis of a programme and targeted approach.

The aim of the state policy is to resolve the problem of training average-level specialists and highly qualified employees, which is of key importance for the Russian Federation's economy. It is especially important for resolving a problem relating to the innovative development of the labour market, creation and renovation of 25 million highly productive jobs, which must meet new requirements related to qualification and the scale of training of specialists. According to a strategy to develop in Russia a system relating to forming applied qualifications and training regular labour force through to 2020, high quality and effective vocational training of needed employees, depending on the needs of the society, social and economic changes and challenges of innovative economy, should be provided.

All this is reflected in a new federal law "On education in the Russian Federation", which envisages a new structure to train employees, regulating the unification of programmes to train average-level specialists and highly qualified employees into one level – secondary vocational education; independent kinds of education, such as vocational training and additional education, were singled out; the appearance of new infrastructure units (educational centres of professional qualification, interregional industry-based resource centres) was proven. To implement the mentioned measures, we should fundamentally change the content of vocational education taking into account employers' demands, content of industry-based programmes for training employees, regional programmes for developing vocational education and programmes for developing educational organizations. This can be achieved with the help of relevant professional and pedagogical employees, the majority of which are teachers of vocational education (Dorozhkin et al., 2016).

Specific features of professional and pedagogical activities of teachers of vocational education allow us to explain peculiarities of their training during the implementation of a competence-based approach and plan the content of an industry-based component of the main professional educational programme for a training programme 44.03.04 Vocational education (by branches) by singling out profession-oriented and specialized competences of a teacher of vocational education from professional competences, corresponding with specialization and profilisation of educational programmes, implementing the requirements of the Federal State Educational Standard of higher education.

The Federal State Educational Standard of a training programme "Vocational education (by branches)" is based on principles of a competence-based approach and is a set of requirements, compulsory for implementing main educational programmes, expressed in the results of an educational process, for which competences, grouped by kinds of professional and pedagogical activities, can be used.

The analysis of works on the problem relating to implementation of the competence-based approach showed that local scientists V.I. Baydenko (2004), E.F. Zeer (2005), I.A. Zimnyaya (2003), Yu.G. Tatur (2004), A.V. Khutorskoi (2013) consider a competence as a targeted mark of education. This gave us an opportunity to clarify the specific feature of vocational and pedagogical education, according to which the content of all integrative components of



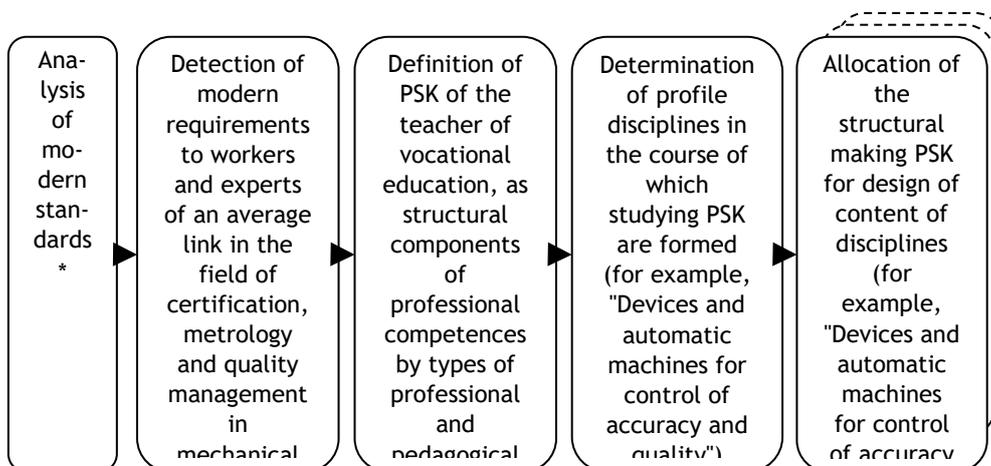
training of teachers of vocational education is planned, including the ones in certification, metrology and quality control in the machine-building industry.

In the last years the competence-based approach in education has become a subject of active discussion and thought in the pedagogical science and practice. Currently, the category of “competence” is understood as an achievement and a criterion of quality of training of specialists (Bermus, 2005; Zimnyaya, 2003); practical embodiment of modernization of content of education (Krayevsky, 2000); personal part of professionalism (Bazarov, 2009); a new approach to creation of educational standards (Khutorskoi, 2013).

Nevertheless, there are no studies dedicated to the problem of development of profession-oriented and specialized competences of students of higher educational establishments during the studying of profession-related disciplines.

The aim of studying profession-related disciplines of the main professional educational programme for a training programme 44.03.04 Vocational education (by branches) is to form a system of technical knowledge in the field of machine-building production, in particular in certification, metrology and quality control in the machine-building industry, development of practical abilities in technical thinking, skills to resolve real production and technical problems and abilities to understand modern machine-building production.

Implementation of the competence-based approach is the reason for singling out and formulating profession-oriented and specialized competences of students of a vocational and pedagogical higher educational establishment for profilization “Certification, metrology and quality control in the machine-building industry”, which are supposed to be developed during the studying of profession-related disciplines. The discipline “Devices and machines to control accuracy and quality” is one of the basic disciplines of this course, needed for developing profession-oriented and specialized competences. The aim of studying it is to form a system of professional knowledge connected with design, use and adjustment of measuring tools and devices used in machine-building production. As the content of the discipline is linked to the engineering sector of knowledge, important for students in their future professional and pedagogical activities while training employees, it must be competence-oriented and be forward-looking. A procedure of discovering profession-oriented and specialized competences, consisting of a number of stages, is suggested (Figure 3).



**Figure 3.** Procedure of discovering profession-oriented and specialized competences

\* Professional standards and the Federal State Educational Standard of secondary vocational education in certification, metrology and quality control in the machine-building industry; professional standard of “Teacher of vocational training, vocational education, additional vocational education” and the Federal State Educational Standard of higher education for a training programme Vocational education (by branches).

The results of the analysis of scientific and regulatory sources allowed us to specify the notion of profession-oriented and specialized competences of students as an integrative set of professional knowledge, skills and personal qualities, stipulating readiness and ability to rationally resolve professional and pedagogical problems, aimed at improving the quality of training of workers and average-level specialists for machine-building production. Using profession-oriented and specialized competences, we can achieve organizational integrity of a process relating to the planning of the competence-oriented content of training of students during the studying of profession-related disciplines.

Structural components of competences, being developed during the studying of profession-related disciplines, were determined according to the procedure of discovering profession-oriented and specialized competences. For example, PSC 1. A person is ready to take part in developing and implementing technological processes relating to production and control of components of mechanisms and machines while teaching a worker (specialist) in the field of technical regulation of a relevant qualification level:

PSC-1.1. A person is ready to take part in developing (planning) technological processes relating to production and control of components of mechanisms and machines;

PSC-1.2. A person is able take part in developing project and working technical documents of machine-building production;

PSC-1.3. A person is able take part in coordinating working places and places of control, placement of equipment and technical equipment;

PSC-1.4. A person is ready to master modern production technologies and control of products in machine-building.

Taking into account analysis of different viewpoints of scientists, we understand the development of profession-oriented and specialized competences as a process of quantitative and qualitative changes, happening during the studying of the competence-oriented content of a discipline by students, which envisages the complication of the training material and reflects specific features of professional and pedagogical activities, during which a student gains experience, enters into new relations and has his values and motives formed (Bashkova & Tarasyuk, 2015).

## Conclusion

It was established that the process of development of profession-oriented and specialized competences of students of a higher educational establishment during the studying of profession-related disciplines will be successful if:

1. You carry out an analysis of documents, reflecting specific features of professional and pedagogical activities of a teacher of vocational education and compare it to the results of a questionnaire among teachers of educational centres of companies and secondary vocational education establishments to



discover the content and structure of profession-oriented and specialized competences during the training of students at higher educational establishments;

2. You draw up a structural and functional model of development of profession-oriented and specialized competences taking into account the integrity, coordination and interrelations of components: purpose-oriented, theoretical and methodological, informative, organizational and activity-related, assessment and adjustment, and performance-related;

3. You fulfill the following didactic conditions:

- plan the competence-oriented content of profession-related disciplines taking into account employers' requirements, mentioned in the professional standard relating to a teacher of vocational education, the main tendencies of development of machine-building production and specific features of professional and pedagogical activities;

- work out the learning and teaching provision of a discipline reflecting specific features of professional and pedagogical activities;

- work out an evaluation tools fund to determine the level of development of profession-oriented and specialized competences of students of higher educational establishments.

### Recommendations

The materials of the article can be useful to teachers focused on developing educational programmes and learning and teaching provision of profession-related disciplines.

The study revealed new questions and problems which should be resolved. The further studying of the problem will require scientific evidence relating to improvement of the content of the learning and teaching provision and finding of new didactic conditions to implement proactive training to develop profession-oriented and specialized competences of students of higher educational establishments.

### Disclosure statement

No potential conflict of interest was reported by the authors.

### Notes on contributors

**Boris N. Guzanov** is PhD, professor of Russian State Vocational Pedagogical University, Ekaterinburg, Russia.

**Olga V. Tarasyuk** is PhD, professor of Russian State Vocational Pedagogical University, Ekaterinburg, Russia.

**Svetlana A. Bashkova** is senior teacher of Russian State Vocational Pedagogical University, Ekaterinburg, Russia.

**Daria A. Ustakova** is student of Russian State Vocational Pedagogical University, Ekaterinburg, Russia.

**Svetlana I. Sotskova** is associate professor of Samara State University of Economics, Samara, Russia.

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