

## ISMGE 2020

### II International Scientific and Practical Conference "Individual and Society in the Modern Geopolitical Environment"

### TRAINING SYSTEM OF DEMANDED SPECIALISTS IN PRIORITY SOCIAL AND ECONOMIC DEVELOPMENT AREAS

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#### *Abstract*

The article presents the results of the author's research within the design basis of the training system of demanded specialists in the Priority Social and Economic Development Areas. It contains three main stages that characterize the internal logic of the considered process of system formation. The authors have defined a sequential algorithm of variable design of the training system for specialists demanded by PSEDA. They defined the key goals of the system design, including strategic ones determined by the remote results of training development; tactical ones connected with the changes in the system at the stages; operative ones necessary to solve the issues during the design. The paper describes the key features of the training system for specialists demanded by the PSEDA, including current skills of future demanded specialists in the machine-building industry, mainly informational, evaluation, entrepreneurial and implementation ones. The analysis of specific characteristics of regional production, geographical peculiarities of the territory, demography in the region, qualitative, quantitative indicators of the educational services market, labor market made it possible to form variable models and systems of specialist training. The system of specialist training demanded by PSEDA should consider factors of requirements on the labor market and process of deficit assessment in professional training on certain specialties at the multi-factor approach. Labor market forecasters select and apply their own forecasting methods. The procedure for assessing labor market needs should determine the required level of professional education for each type of occupation and profession.

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**Keywords:** Algorithm, design, PSEDA, specialists, training system.



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## 1. Introduction

The training of future specialists in higher education is a key objective of the education system. The special complexity of this training arises in the training of students at higher education institutions for a particular company according to employers' requests. Today, many enterprises face the problem of quality training of specialists in creating priority areas of social and economic development and placing new businesses in these areas. This problem primarily arises as a result of the limited educational programs of the universities located in these territories that do not always prepare specialists of the necessary specialties for a new business, located on PSEDA.

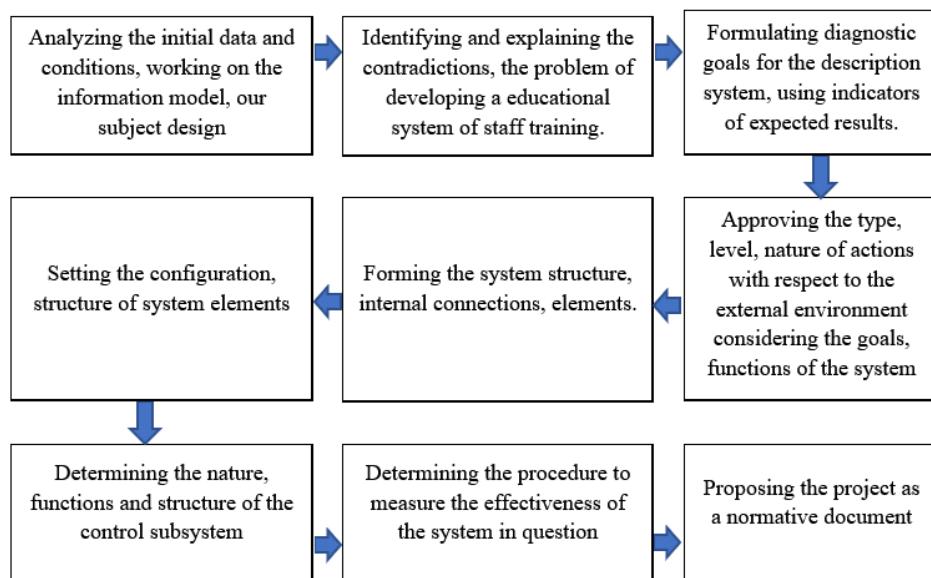
Creating a training system for demanded specialists in the Priority Social and Economic Development Areas (PSEDA) is a key tool capable of eliminating the existing shortage of demanded specialists in a timely and high-quality manner.

## 2. Problem Statement

Creating a system of training of demanded specialists follows from the presented logic on the structure defining stages, algorithms of construction that allow performing actions according to results of previous stages of designing, the interaction of system with changing environment (Kadyrova, 2013).

Three main stages characterize the internal logic of designing this process. At the first stage, we identify the problem by studying its relevance, conceptuality. This step makes it possible to identify real problems related to barriers to the development of innovative processes in education, economy, to identify areas for problem-solving. In the second stage, we set goals and predict results. The objectives of the phase include the need to concretize the intention, to understand the logic of achieving the results, their importance for solving the issues. The third step is necessary to form a set of resources required to produce results, as well as to identify ways to achieve results. The stages are related to the peculiarities of the processes that make them up and they can be considered as independent and have their own internal logic. The logic of the sequence of stages shows the approach from the time space of the past to the present and future spaces. It considers a uniform direction of designing on a future and cyclicity of thinking processes. We believe that the problematization and understanding of project activities are connected with difficulties and lack of ways to eliminate them. Conceptualization is understood as a process of revealing the main direction of the planned activity content which becomes a final part of problematization: the designer carries out the analysis and generalizes all available experience for the elimination of difficulties. This process is the initial stage of forming new, subsequent experience (Kovalevsky, 2004). New ideas here set a new strategy of action and a way of solving the appeared problem. We believe that goal setting is an anticipation of the result in the thought process and the action is oriented to it in the future. In fact, the goal statement defines all other steps. The task of forecasting is to specify the direction and content of actions. We note that the carried design has not a prototype, ie soft design which considers the impact of all aspects, the behavior of the unified system and its elements, changes in performance indicators. This design stage concludes with the formalization of the analysis content. Essentially, there is strategic planning based on the analysis, summarizing the experience of overcoming the problem situation that arose at the initial stage. We formulate the action strategy in a

conditional space of the future as a real prospect and creation of project steps to implementation. The third stage of the project, tactical planning, relates to the identification of possible areas of project activities. Through this stage we form the resource support, assess the potential opportunities for the implementation of the set goals, determine the options and directions of our actions. Further we realize the projected directions of problem-solving, proceeding from external environmental factors. In turn, the design technology consists of analysis and diagnostics, forecasting and elaboration of project actions. The design technology for the training system is a single space of technology for the system design of interaction with the external environment, structure design technology and internal system links. It is also the space and design technologies for management functions, which provide the development of the system in a rapidly changing environment. Figure 1 shows the algorithm that is fundamental to the variable design of a system for training demanded specialists (Kadyrova, 2013):



**Figure 01.** Algorithm of variable design of the training system for specialists demanded by the PSEDA.

According to the logic of project implementation, the process has the following components: indicative, executive, control. The first part presents a set of actions to analyze the original information system. The second includes working operations to design the system itself, drawing up an educational project (it is a socio-educational project in our work). The final control component has a cross-cutting nature, represents a control activity throughout the process and is final in nature. We will give the algorithm stages in the design of the training system for specialists demanded by PSEDA (Ibragimov & Ibragimova, 2016).

### 3. Research Questions

The first stage is the most difficult, it is the identification stage which includes stating the goal of the considered system as the main system, modeling, criterion aspect. The goals predetermine "methodological evidence" of the correctness of the chosen targets to the realization of interactions towards the external environment, functional, structural organizations of this system, to the configuration

of an integrative educational organization - the main element of the system relative to the control subsystem. For PSEDA, the goals of the pedagogical system are driven by the need to introduce an innovative economy, based on the analysis of economic conditions, sociological research, technical capabilities to carry out the professional activities of staff with different training levels (Jarvis, 1985).

The tasks of the methodology and methods for forming educational goals are often presented at the micro-level (it is about educational programs, learning and teaching goals, etc.). We should note that the content and nature of the goals set at one training level are dependent on the approach of their formation at the highest levels.

#### **4. Purpose of the Study**

The goals of training the specialists demanded by the PSEDA, not converted into the quality of educational goals of training, are a social order. The goals are often set without understanding the relationship between the goals of vocational education and the improvement of the system itself. Meanwhile, these goals influence the way a specialist leaves an educational institution to reach the required level. The development goals determine the directions of changes in the system or its components to make the most qualitative training of demanded specialists for PSEDA. Such changes have both a radical and clarifying character. The design process involves setting goals for the following levels:

- strategic goals determined by the remote results of training development;
- tactical goals related to changes in the system at stages;
- operational goals required to address issues during the design process.

The action strategy depends on the general or initial goals, the design progress depends on the goals achieved by the whole project and characterized by sustainability and permanence. Tactical goals are dynamic, changing and presented in different programs. The designer clarifies and corrects them in the design process, this case represents the design performed at a constant goal setting.

For PSEDA, we defined the goals of training highly demanded specialists of different levels as a set of tasks to be solved by university graduates during their activity on a mandatory basis. We divided the design goals into two types. The first ones consider educational resources of the training system for demanded specialists of different qualifications, human resources potential, material base, relations with production partners (Yavorsky, 2008).

The second goals address the requirements of enterprises where specialists of the respective specialty work. The requirements are formulated through a specified quality criterion, the technical component of production and technology, job descriptions and passport for a certain specialty. The main point of the content of these goals consists in accordance with the urgent and perspective needs of production, a growing movement towards the optimal correspondence of the system to the professional functions.

Formation of employers' requirements to the staff of different qualifications relies on the model of a professional as a personality, creative potential of an employee, his professional competence, public opinion. A separate criterion is a general and professional culture (Khutorskoy & Khutorskaya, 2003).

Such versatility in requirements defines many directions of design goals. Our research sets the main and final goal of the design as the creation of an integral image of the training system for the specialists demanded by the PSEDA in compliance with its current and future requirements to such systems, staff and their qualifications, the prospects in the scientific field, changes in the economy, culture, the requirements of society to the individual and professionals of this qualification.

Determining the final goal of our project, we consider the compliance of the goals with the requirements to the level of professional and social functions of the staff at work, in the society, the complex of goal implementation given all the changes in the training system, the possibility of changing the directions of goal implementation and changing the evaluation of processes and results in the system.

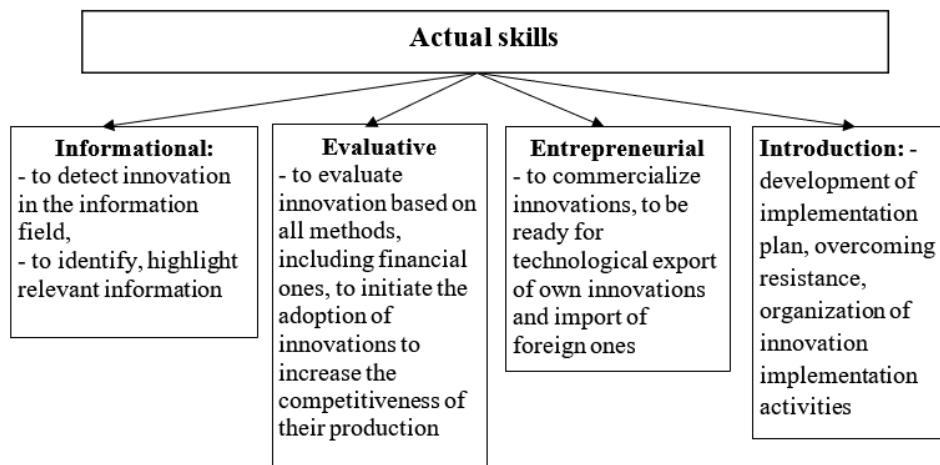
## 5. Research Methods

A prospective training system for specialists demanded by PSEDA develops according to the corresponding stages of modeling, which include entering into the problem, creating a system of through elements in the structure of the study object. In our variant the object is the training of the specialists demanded by PSEDA (Kachugina, 2009). Then there are the following stages: formation of basic components characterized by functional completeness of interrelation of system elements; revealing of object dynamics (peculiarities of the system functioning, system indicators, cause-and-effect relations, etc.).

Creating an ideal training system for specialists demanded by PSEDA needs to make a general analysis of the requirements for their training, professional activities at enterprises of various industries, to find opportunities to transform professional functions into training activities. At the second stage of the project, we use pre-project analysis of professional activity for staff with different qualifications. This method uses an approach that defines the features of professional activity, reveals the degree of professional mastery that helps to implement professional functions. The approach makes it possible to define the system of knowledge that forms the information basis for professional skills; to transform the system of knowledge and skills into educational disciplines, knowledge of practical order into thesis and diploma design work (Bekrenev & Mikhelkevich, 1994). Figure 2 shows an example of actual skills of the specialists demanded by machine-building enterprises operating in the PSEDA zone.

Figure 2 shows an example of actual skills of specialists demanded in the machine-building industry. The structural components of the training system for specialists demanded by PSEDA represent educational and professional activities that are gradually moving into one another (Kadyrova, 2009).

Our analysis made it possible to identify the demanded skills for modern specialists, workers (and employees in machine-building industries). Skills have high mobility, which provides a person with fast mastering of modern design and production technologies, mastering of electronic document management and includes information, entrepreneurial, evaluation and implementation skills.



**Figure 02.** Actual skills of future specialists demanded in the machine-building industry

This case represents modeling with the application of a system of quasi-professional situations to reveal the content of the educational process in development, which promotes the integration of knowledge in subject areas. Creating a system of through elements in the structure of the examined object implies the selection of the system-forming element. Within the adaptive organizational and educational system for training a specialist demanded by PSEDA, such an element was the educational activity with substantial and procedural characteristics.

The basis for the formation of substantive and procedural characteristics of educational activity is the specifics of professional activity for high-tech industry. Regional perspective is a rather important resource for identifying significant characteristics in the set of basic indicators of an educational activity. It is third stage of modeling by Dakhin (2003). In the training system for specialists demanded by PSEDA it is formed on the basis of perspective plans for development of new PSEDA production; peculiarities of location of machine-building enterprises, the level of relations with the production of other spheres of activity; technical and economic indicators, unified characteristics of internal production factors, etc., since labor markets are constantly changing in the regions. Due to these circumstances, the adaptability of the studied system to the rapidly changing socio-economic factor of development is the main requirement for the creation of a promising system of training (Lizunkov et al., 2010).

The study of all aspects affecting the development of production in the region is the basis of forecasting. The forecast for the regional labor market needs is the main direction of this activity. Thus, it is necessary to refer to the works of the authors reflecting this problem (the demand for the staff training necessary for the economy): T.L. Klyachko, S.Y. Alasheeva, A.Y. Savelieva, T.G. Kuteynitsyna, N.Yu. Postalyuk, Yuri Pavlova, etc. (Alashev et al., 2015; Klyachko, 2009; Saveliev, 2002; Saveliev, 2011; Zeer et al., 2005). Building a predictive model needs one of two directions: to determine the factors that characterize the change in the predicted indicator, or to predetermine the behavior of the indicator in the future using the analysis on isolated indicators. The multi-factor approach used in modelling shows important causal mechanisms. Their influence is tangible for the process of developing domestic vocational education. Scientists highlight the following factors: crisis phenomena in the economic sphere, which influenced the financing of internal corporate training; application of the system of innovative

grants; use of the USE; opportunities for development of the middle class with a prospective choice of priorities for family financing, etc.

## 6. Findings

Designing a system for training specialists demanded by the PSEDA needs the use of projections of the said factors relative to the chosen territory. The analysis of specific characteristics of regional production, geographical peculiarities of the territory, demography in the region, qualitative, quantitative indicators of the educational services market, labor market provides an opportunity to form variable models and systems in the staff training field.

Within multi-factor approach, the training system for specialists demanded by PSEDA should consider factors of requirements on the labor market and process of deficit assessment in professional training on certain specialties. Labor market forecasters select and apply their own forecasting methods. The methodological approach to labor market projections is appropriate for consideration of a specific socio-economic situation. The procedure for assessing labor market needs should determine the required level of professional education for each type of occupation and profession. This point is particularly important in terms of the transition to a two-level model of higher education. The assessment of needs from the perspective of professional education uses the All-Russian Classifier of Work Professions, Positions of Employees and Classifier of Tariff Classes, as well as other normative documents of the Ministry of Education and Science of the Russian Federation (The Law on Education, n.d.). The estimation consists of statistical research of real and desirable qualification level of future specialists of production at obligatory forecasting of knowledge demanded at the enterprises. For example, the work with technical documentation assumes knowledge of foreign languages, so, the parallel education will be actual. The resource approach in modeling the training system for specialists demanded by PSEDA strengthens such an important characteristic as integrity related to our system. If the federal scale in the system allocates only neoplasms representing an ideal level of staff training, then the regional positions and the position of a particular enterprise, whose staff needs are met by the educational institution, provide an ideal image with neoplasms, whose formation will ensure the implementation of educational needs of the region and PSEDA in particular (Gaponyuk, 2011).

Identification of levels in the training system for specialists demanded by PSEDA provides prospects in solving these tasks. We should note that the level approach in creating a specialist training system provides an opportunity to understand the differences in socio-economic development of the world and our state or a particular region, which is important for creating an education system for a region.

## 7. Conclusion

Designing the training system for specialists demanded by PSEDA requires to consider the technical policy of a particular production, whose needs directly affect the work of the educational organization. In this case, all significant areas of technological innovation implemented in the production, such as integration of systems for automation, integration of technological processes, rapid modeling

technology, management through the Internet, should be reflected in the educational activities and the content of curricula (Lizunkov et al., 2014). The structure of the training system for specialists demanded by PSEDA includes characteristics of the most significant requirements to professional activity; analysis of strategic plans of the country aimed at the development of both the industry and sectoral regional complexes; technical policy of industrial enterprises (customers) for the provision of services in education. The main approaches to modeling are the following: a competency-based approach, through which the learning activity of the learner becomes a system-forming element of the model; a multi-factor approach, which ensures the identification of mechanisms that determine the development in education (Shamova et al., 2006; Shishov & Agapov, 2002).

## Acknowledgments

The study is carried out with the grant support for young scientists - candidates of sciences, number MK-313.2019.6, issued by the President of the Russian Federation.

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