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**CRUCIAL OCCUPATIONAL SKILLS FORECASTING: THE EXPERIENCE OF RUSSIA
AND EUROPEAN COUNTRIES**

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Abstract

The issue of formulation and forecasting of crucial occupational skills list necessary for employees on the labour market in the modern context in Russia and foreign countries is considered. The main element is the interaction of state, education system and employers in terms of national VET systems.

Key words: vocational education and training, occupational skills, forecasting

1. INTRODUCTION

The world economy moves towards a new technological structure and new requirements for all components of the economic systems of different countries appears. It is necessary to identify correctly the direction of the new economic structure and to find appropriate mechanisms for personnel training to ensure the competitiveness of any country in the world in modern terms.

The role of analysis and forecasting of crucial occupational skills as one of the major factors in the development of human capital is particularly important for the Russian society now facing the objective necessity of transition to an innovation economy.

Modern society is distinguished by the rapid obsolescence of information, resulting in the devaluation of special professional competencies. The average rate of time updating applicative, and in many respects the basic and professional knowledge in technologically advanced industries is 3-5 years, during which to one-third of special knowledge of the employee are depreciated some researchers say (Medyankova E.V., 2009). The knowledge gained by the student during course by the time they graduate is out of date by about 50% (Zahkarov P.N., 2007). In addition, in the last decade, the society faced with an enormous paradox - an increase in the number of received education and training process was accompanied by the growth of professional incompetence (such as inadequacy for scientific and technological revolution demand) (Tarakanova E.V., 2010).

The foregoing suggests that under current conditions, all countries should develop a system of forecasting future crucial occupational skills required for workers entering the labor market. This system should complement the quantitative forecasting of the labor market parameters, which is already insufficient for the development of human potential.

2. EUROPEAN COUNTRIES EXPERIENCE

In the context of the *OECD Skills Strategy* (2011), OECD countries understand the concepts of 'skill' and 'competence' interchangeably. By skill (or competence) mean: the bundle of knowledge, attributes and capacities that enables an individual to successfully and consistently perform an activity or task, whether broadly or narrowly conceived, and can be built upon and extended through learning.

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There are *general cultural competence*, such as the ability to own a foreign language at a level no lower than conversational and *professional skills* for different activities: the ability to understand and apply research and application of modern mathematical tools, the ability to collect, process and interpret the data of modern science studies, etc.

In Europe the understanding of the need to develop a list of crucial occupational skills required for employees came in the early 2000s. In recent years, cooperation between state and employers in education and training in Europe played a crucial role in shaping the European society future.

Activities for the vocational education and training development took place in parallel in the framework of the European Union (EU) and Organization for Economic Cooperation and Development (OECD). Council of the European Union for Education, Youth and Culture on the November 12, 2002 adopted resolution on enhanced cooperation in vocational education and training in *The Copenhagen Declaration*. Cooperation implied forecasting demand of occupational skills of employees and graduates. This process is known as the Copenhagen process and the activities continue up to now days. One of the trends in the development of this program became assisting in developing the crucial occupational skills list and qualifications at industrial level with the interaction of the state, educational institutions and employers.

The development of vocational education and training (VET) system became one of the priorities of education policy at a *Meeting of Ministers of Education - OECD in Copenhagen on September 22-23, 2005*. The meeting resulted in a program whose aim was the establishment in the OECD countries a direct interaction of VET and the labor market, as vocational education and training are key components of the economic demand for young people in the labor market, as well as ensuring the necessary level of professional qualification.

Since 2007, the OECD is implementing a special research project *Vocational Education and Training (VET)*, focused on the definition, and then the formation of skills and competencies that can be used later in the labor market. VET includes education and training programs developed and determined to a particular work or particular type of work (Chair's Summary from the Meeting of the Education Chief Executives, 2005).

VET systems are common in many OECD countries. Each level of interaction between government, employers and the education system has its own particular function. An important element of any VET system is forecasting of employment, occupations on demand and competencies.

Forecasting of the professionally trained personnel demand is based on existing national models, which provide short-, medium-and long-term forecasts. Forecasting of occupational skills is realized in the framework of the quantitative forecasting and is an integral part of the VET.

Data on the country's economic development is pooled together and various scenarios of economic development are projected. The result of forecasting is data on labor demand by sectors, occupations in the state and regional level. It is difficult to predict crucial occupational skills on the labor market but the way out is forecasting within the professional and educational standards development. One way to assess the crucial occupational skills and competencies in the labor market is consulting with employers and trade unions. Many national models in addition to the quantitative forecasting introduce the qualitative characteristics, taking into account the new competencies that will be needed in the labor market in the medium term.

An integral part of any system of VET is the interaction of the three parties: government, employers and the education system. Following table was published in *OECD Reviews of Vocational Education*

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and Training. *England and Wales* (Hoeckel K., Cully M., Field S., Halász G. and Kis V., 2009) and it shows the degree of involvement of employers in the functioning of the system of vocational education and training in OECD countries.

Table 1. The employers' engagement in the functioning of the vocational education and training system in OECD countries

	Tasks and actions	Institutional setting	Country examples
Agenda setting	Analysing evidence Recognising problems Determining issues for reform	Collectively through employer organisations, associations, chambers Individually, using employer surveys and opinion polls	Advisory Council for Initial Vocational Education and Training, Denmark Employers' surveys e.g. in the United Kingdom and Australia
Policy formulation	Reforming the regulation, structure and funding of the VET system Developing/updating the qualifications framework Developing curricula, content and duration of VET courses Determining number of VET places	Collectively through employer organisations, associations, chambers School governing bodies which include employers Regional or sectoral bodies	Advisory Council for Initial Vocational Education and Training, Denmark VET partnership (federal government, cantons and social partners) in Switzerland Sectoral employer organisations in Australia and the United Kingdom Regional VET centres in the Netherlands, Regional development and training committees in Hungary
Policy implementation	Promoting VET e.g. by hosting interns Delivering on-site training Sponsoring training for employees Examining student performance	Individual employers offering workplace training (including sector-wide basic practical training), apprenticeships, or releasing staff to supply VET teachers to providers Individual or collective financing, under voluntary or mandatory arrangements	Apprenticeships in dualsystem countries Industry courses in Switzerland Training levies in Hungary Final examination in the workplace, e.g. in Germany
Policy evaluation	Assessing the quality of VET outputs Assessing student outcomes	National VET institutions Collective employer bodies Individual employers (e.g. through surveys)	KRIVET, BIBB, NCVER, etc. Surveys of employer satisfaction in Australia and the United Kingdom

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As can be seen from the table, the degree of employers' involvement in the functioning of the vocational education and training system in OECD countries is quite high. Employers' participation is based on the built-in mechanisms in the education system, which allows aligning the interests of all stakeholders in the process. It is important that employers are collectively or individually included in the process of determining the list of crucial occupational skills on the labor market, its realization and evaluation.

3. DEVELOPMENT OF CRUCIAL OCCUPATIONAL SKILLS LIST IN RUSSIA

The work on implementation of skills approach in the education system and the system of forecasting the economy needs in skilled workers in Russia is actively developing. Despite some successes in this area, there are several challenges that lie ahead.

Bachelor and Masters were first introduced in high school in 1993. In 2011 two-level training became fundamental. Meanwhile, in the language of the professional qualifications bachelors and masters are not yet presented to the labor market. The so-called education qualifications - Bachelor and Master - do not have a systematic description of the various economic activities and are not transparent to Russian employers.

Despite the fact that the integral state policy in the development of national qualifications systems is now being formed, some rather serious steps have already been done. This was facilitated by several factors: the Bologna and Copenhagen processes and initiative of employers, an initiative of the Russian Ministry.

Russian Ministry of Education developed a new generation of federal state educational standards. The federal state educational standards have such distinctive features as a distinct character of competence, substantiation requirements for the results of the development of basic educational programs in the form of competencies subdivided into general (universal) and professional (subject-specialized).

In the past few years in the professional community a new paradigm of quality management training, based on professional standards as a more modern form of a formalized description of professional activities, was formed at the level of individual areas of professional activity (Leibovich A., 2008). Professional standards are significantly different from other ways of describing the requirements to a specialist:

- they allow to systematically reveal the professional activities of professionals involved in the overall technological problem (research, production, design, maintenance, etc.), following the structure of a holistic process and respecting the continuity of the activities at different levels of qualification (for example - at the levels of workers, equipment, engineer and manager);
- description structure of the professional standards involves the use of more modern design in the form of combinations of requirements for knowledge, skills and competencies, professional expertise, which ensures the continuity of professional standards, national qualifications framework, on the one hand, and educational standards and programs - on the other.
- in standards it is possible to identify certifiable professional activities in which the employer is particularly interested in the professional, and thus focus the problem of independent evaluation and certification of qualifications in a limited field of essential characteristics.

These and other features of the professional and educational standards, make them much more useful elements of the national system that links the world of work and scope of vocational education.

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Professional standards and federal state educational standards are closely related. National system of professional standards is a system of professional qualifications description, aimed at different levels of interaction between the system of vocational education to the labor market (the political level, the level of organizations and individuals). Through this relationship the labor market gives the signal of its generalized demand for human resources, which in turn is a reference to the education system, which should offer citizens effective educational directions for these requirements through a system of forecasting the economy needs for qualified personnel with an emphasis on the acquisition of new competencies (e.g. Kekkonen A., Sigova S. 2012).

At present, the problem of a national system of qualifications and professional standards forming is indicated in the *Strategy 2020: A new model of growth - a new social policy*. Its aim should be the increase of the workforce competitiveness, creation of a support system for recognition of the employee rights (assessment and assignment), professional development, improving the coordination mechanisms of the market of professional educational services and the labor market.

The Russian problem is the lack of scale and quality of training of skilled workers in demand on the labor market and the ability to solve the problem of an innovative development, necessitates identifying and forecasting crucial occupational skills on short-, medium-and long-term horizon.

4. SKILLS LIST FORECASTING METHODOLOGY

At the present time to solve the problem sought to identify occupational skills in priority areas of science, technology and engineering is implemented large-scale project "Study of long-term demand for staff with competence in the field of technological innovation." Petrozavodsk State University and, Moscow School of Management "Skolkovo" joined their efforts in this direction.

The project assumes that firstly skills the priority areas of science, technology and engineering should be determined for the competence. This approach would allow the implementation of the innovative development strategy of Russian economy, that is based on the preferential development and implementation of technological innovation in key areas of applied research within the priority areas of science and technology. Priority areas are defined by Decrees of the President. In the draft of State Program "Development of Science and Technology for 2012-2020 years" the following seven the priority areas of science and technology are listed: information and telecommunications systems, biotechnology, medicine and health, new materials and nanotechnology, and space transportation systems; environmental management, energy and energy efficiency.

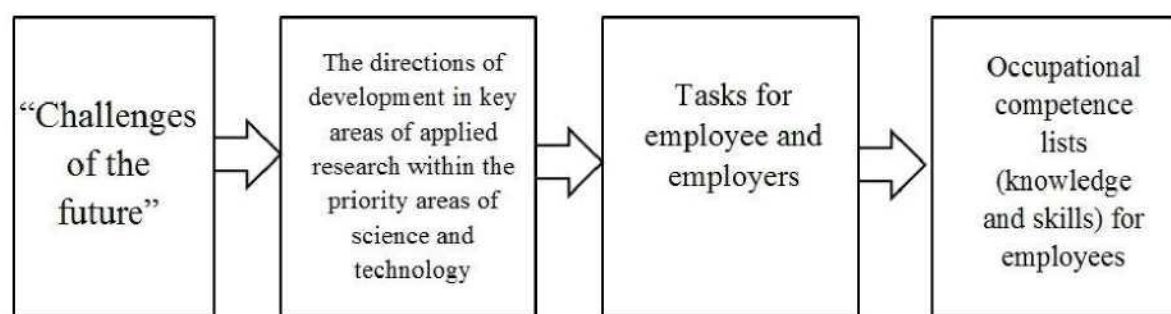
The following methodology is proposed to reveal crucial occupational skills in the priority areas of science and technology.

1. Determination of the main trends of each of the priority directions of science, technology and engineering development in Russia and the identification of key "future tasks" are addressed to employees in the course of their professional activities.
2. Identification of structural levels of the crucial occupational skills development: what tasks and at what level should be solved. This may be the challenge that companies working within the priority areas of science and technology face or facing the priority tasks in general or an employee at a particular workplace.
3. Determining the structure of occupational skills models: which group should fill the competency model.

4. The formation of skills lists in accordance to the developed structure.

Determination of the "challenges of the future" is the first and one of the most important steps in revealing of occupational competence lists (knowledge and skills). "Challenges of the future" reflect basic perspective directions that would be important and up-to-date in the field of technologic innovations. "Challenges of the future" include the fundamental strategic technological developments that would affect the entire scope of technological innovation, determine the development of critical technologies, which would be focus area of innovation and potential discoveries in the field (see Picture 1)

Picture 1. "Challenges of the future" is the key element of crucial occupational skills determination.



Based on the "challenges of the future" it becomes possible to identify specific areas of the key spheres of science, technology and engineering priority areas. The assumptions on the potential specific problems that should be solved at the level of the industry, company, or individual employee are based on the "challenges of the future". Given the complexity and novelty of the future tasks, competencies of employees, ie the knowledge, skills and practical skills that are needed to address them are identified.

The next important issue is to determine the structural levels of the competencies development. Why it is so important to address this issue? The matter is that crucial occupational skills are determined by two factors. The first is the nature of professional activity (prevalence of stereotypical or unique (non-recurring, unpredictable, action). The second is specific tasks to be undertaken by employee in the course.

In connection with the above, the following levels of aggregation competences are selected:

1. The level of the firm (competence can be described in in-house standards, which are developed and used in one or more subsidiaries) or the level of the industry (defined in national and international professional standards);
2. The level of jobs / positions - the aggregation of competencies are specific to jobs;
3. The level of the workplace - it is assumed the maximum specification of the required competencies.

This approach demonstrates that at different levels of detail the competence requirements would be different.

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Thus, depending on the results, namely, the identified "challenges of the future" and the level identification to which the model of competence should be developed, informative content appears.

Currently this approach is being tested across Russia and the obtained results allow establishing the true images of the sought-after professionals.

Methodological approach used in the models would allow reflecting the most current and important professional competencies needed to address the various challenges of the future. In addition, the possession of the identified competencies would enable professionals to successfully master the subject field of the future challenges and to achieve productive professional results.

5. CONCLUSION

The formation and forecasting of the crucial occupational skills list for the labor market is now demanded for the successful long-term development. This is a way to effectively control the development of human capital in Russia.

The main factor in the acquisition of crucial occupational skills advocates a balanced policy in the field of education and training. The state, in conjunction with employers and educational institutions should continue to develop and improve professional standards, the requirements for professions and positions, and later synchronize them with the educational standards.

OECD countries have developed a balanced system of interaction between government, employers and the education system to identify and forecast the list of crucial occupational skills for workforce training. The study of foreign experience in this field will allow to use the best practices of developed countries for the formation of the economy needs, taking into account relevant professional competencies. In particular, it is necessary to introduce the most relevant and adapted to for Russia the provisions of OECD Skills Strategy into the education system modernization programs, taking into account long-term development programs of the country. This will allow the executive authorities to plan future directions for regional development and provide appropriate workforce training. It seems promising to establish a uniform terminology and tools to assess the knowledge gained, and the list of demanded in the future skills, the development of mechanisms for efficient allocation of resources to develop relevant skills for the labor market.

Russia is actively developing and implemented competence-based approach to planning the development of human capital. It should be developed further. The problem of the formation of modern occupational skills for professionals should be solved in conjunction with employers' associations, relevant government departments and the education system. The list of crucial occupational skills can be a key transition between the employers demands and training in vocational education system. This list would allow employers to articulate their requirements for employees, to participate in the development of qualification requirements, assess the future needs of sectors of the economy for skilled workers. For the education system, in turn, the list would allow more flexibility to train personnel with professional education.

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