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**THE LABOR PROTECTION SPECIALISTS' PROFESSIONAL
COMPETENCE STATE IN THE DIGITAL ECONOMY**

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Abstract

This paper examines the labor protection specialists' professional competence state in Russia in the rapidly developing digital economy. A competent occupational health and safety specialist must be stress-resistant and apply information and innovative management technologies to implement, monitor and improve the professional risk management system. The authors evaluated the labor protection specialists' professional competence improving socio-economic aspect. The professional competence level influence on the injuries level in the organization is shown on the one of professional competence formation factors example – basic education. The paper presents new competence-based problems, including digital economy problems, faced by labor protection specialists. Such specialists' high competence level is one of the conditions for stable functioning and companies development for employers, which allows them to manage human resources effectively, reduce socio-economic losses, improve safety culture, form social and labor relations in the field of labor protection, and implement the “zero injuries” concept. To form a modern occupational safety specialist, it is necessary not only specialized higher education, but also additional education that has a full range of new interdisciplinary technologies, including financial management and human resource management.

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1. Introduction

The digital economy creates a new reality for effective production management. The various sectors economy digitalization growth rate in the world is rapidly growing (Dyukina et al., 2020; Merzlikina & Kozhanova, 2020), while the professionally competent specialists training system in labor protection in Russia is relatively inert. In the context of dynamically changing management classical forms and methods in various companies around the world, the requirements for occupational safety specialists are increasing, which makes it necessary to constantly improve their professional competence.

The competence approach as a tool for improving the production management efficiency, increasing labor productivity, reducing production and professional risks is considered in various countries (Boyatzis, 2008; Eeckelaer & Treutlein, 2010; Elin, 2014; Huang et al., 2009; “Mainstreaming OSH into business management”, 2010; “A majority of U.S. businesses report workplace safety delivers a return on investment”, 2001; Radyuk & Basinskaya, 2013; Subetto, 2006; Targoutzidis et al., 2014; The return on investment in safety, health and environmental management programs”, 2002).

In the digital economy, senior occupational safety specialists face new competence problems in comparison with the tasks 80-90-ies last century. It becomes necessary for them to have additional knowledge in the field of new principles and technologies companies' financial management (Dyukina et al., 2020).

The high-level occupational safety specialist presence is one of the factors for employers in the digital economy obtaining companies' stable functioning and development. This is a way to effectively manage the company's human resources, reduce socio-economic losses in the organization, improve the safety culture, and form social and labor relations in the field of labor protection. Large international companies in Germany, Spain, Finland, Denmark, Great Britain, Sweden, England, Holland, France and other countries are particularly interested in competent occupational safety specialists (Hale & Booth, 2019; Madsen et al., 2019; Sánchez-Herrera & Donate, 2019; Swuste et al., 2020).

The investments costs and benefits comparison in labor protection according to the various countries estimates shows that 1 dollar of direct enterprise losses associated with unsatisfactory labor protection organization entails at least 2 dollars of indirect losses (Dyukina et al., 2020). The such losses ratios were obtained as 1:2, 1:3, 1:4 in the works of foreign colleagues (“A majority of U.S. businesses report workplace safety delivers a return on investment”, 2001; Dyukina et al., 2020; Huang et al., 2009; Elin, 2014;). At the same time the assessment, as a rule, was carried out only on the most significant indicator – the occupational injuries indicator.

The study purpose is the labor protection specialists' professional competence state determining in Russia and its socio-economic aspect assessment in the digital economy.

2. Methods

The research used econometric methods (analysis and synthesis, statistical analysis, method of principal components).

Research has been conducted on more than 1.5 thousand organizations employing about 2.5 thousand occupational safety specialists in Russia from 18 regions of Western Siberia and Khanty-Mansi Autonomous Area for the period 2003-2020.

3. Results

Qualification requirements and professional standard require occupational safety specialists in Russia to have a basic higher professional education in the field of "Technosphere safety" or industrial safety, or higher education and additional professional education (professional retraining) in the field of occupational safety. Secondary vocational education, professional retraining in the field of labor protection and work experience are also allowed. The occupational safety specialist work corresponds to the 6th qualification level, and the occupational safety service head work corresponds to the 7th qualification level of the National and European Qualifications Framework for lifelong learning.

However, the presence of specialized education and work experience is not enough for the digital economy. The occupational health and safety management technologies digitalization prospects imply higher requirements to the professional competence level.

The authors understand the labor protection specialist professional competence as the knowledge of techniques and technologies in a particular activity field, a set of socio-communicative, economic-mathematical, methodological and valueological knowledge and skills, which implies the ability to think creatively and progressively, predict the results of own activity and critically assess their consequences, take responsibility and have stress resistance, professionally apply information and innovative management technologies for implementation, monitoring and improving the professional risk management system (Bakiko et al., 2020).

According to the authors, 4 factors are necessary for its formation: basic education (Subetto, 2006), work experience, regular and effective professional development, and the availability of interdisciplinary additional competencies (Kuleshov et al., 2020).

Within the framework of this study, the labor protection specialist professional competence state was assessed based on a survey of 2485 specialists involved in labor protection at 1.572 enterprises, institutions and organizations in 18 cities and districts of the West Siberian region and Khanty-Mansi Autonomous Area-YUGRA.

The data analysis obtained by the staff of Omsk State Technical University allowed the authors to obtain the following results:

1. Labor protection specialists have a basic education: 16% – higher education in labour protection; 40% – higher education in the sciences; 11% – higher education in the humanities; 26% – specialised secondary education in the sciences; 3% – specialised secondary education in the humanities; less than 1% – military education and education obtained in educational organization of Russian Emergency Ministry. At the same time, 68% of occupational safety specialists without specialized education have passed professional retraining.

2. 11% of specialists have an experience as a labor protection specialist up to 1 year; 36% have an experience as a labor protection specialist from 1 to 3 years; 30% have an experience as a labor protection specialist from 3 to 10 years; 28% - more than 10 years.

3. Specialists pass regular professional development in labor protection: 83% of them get labor protection short-term courses (usually 40 hours); 14% – advanced training (72-250 hours); 3% of specialists do not study. At the same time, it should be noted that the expert assessment revealed the labor protection specialists percent that have passed advanced training courses not effectively or formally – it is not less than 87%.

4. Not more than 7% of labor protection specialists have additional interdisciplinary competencies in the field of fire, industrial or environmental safety, protection in emergency situations, in the field of specialized advanced information technologies, professional risk management and human resources. However, it should be noted that different organizations may require a different set of additional competencies or may not require them at all. The digital economy requires senior labor protection specialists to have competencies in the field of new financial management technologies, taking into account the companies' specifics.

5. Taking into account the normative requirements for a labor protection specialist (specialized education or professional retraining, work experience, frequency of training in occupational safety courses), it can be noted that the percentage of nominally competent labor protection specialists is not more than 63% of the respondents total number.

Only 14% of specialists from them have specialized higher education in labor protection, the rest have additional professional retraining. The remaining 49% of occupational safety specialists are insufficiently competent, have non-major education, short work experience, and do not regularly undergo mandatory and effective training in occupational safety.

Thus, it is possible to rank occupational safety specialists by professional competence levels, taking into account the results obtained. The professional competence levels will show the employer the appropriate occupational safety specialist rank. The experimental data volume allows the authors to give averaged description of the labor protection specialist enlarged professional competence levels using expert method. A high professional competence level is typical for occupational safety specialists who have higher specialized education, work experience of more than 10 years, possess additional competencies and regularly and effectively improve their skills. Average level is typical for higher specialized education or professional retraining, work experience of at least 3 years, usually without additional competencies, with minimal professional development in accordance with legal requirements. Low level is typical for non-major higher and secondary special education with professional retraining (or without it), with experience in the position of up to 3-5 years, without additional competencies and without regular professional development. For example, the lack of medium and high levels labour protection professionally competent specialists in the Omsk region, where the greatest specific weight in GRP is industry (35%), trade (over 13%), agriculture (10%) according to Omsk State Statistic Service is about 50% of labor protection specialists total number in the enterprises. The calculation is based on the conditional standard of 200 employees per 1 occupational safety specialist. In organizations with international investors (large industrial partners), the labor market in this area is changing dramatically. In such organizations, more than 82% of occupational safety specialists have a high professional competence level, 15% – medium and 3% – low.

Small contracting organizations in Russia, where the migrant workers share is high, have the lowest labor protection specialists' professional competence. Here, the high professional competence level is not more than 3%, the average professional competence level is not more than 9%, and the rest have low professional competence level.

4. Discussion

The study shows the labor protection specialists basic education influence to the minimum enterprises losses with the existing industrial injuries level on the example of one the professional competence formation factors.

The objective data analysis on a fiducial sample of 661 organizations in which full-time occupational safety specialists have a basic higher professional education or professional retraining in the field of occupational safety allows to show the occupational safety specialist professional competence impact on the average injuries level over 5 years. At the same time, the industrial injuries average level in organizations that do not have a full-time occupational safety specialist is taken as 1. The principal components method revealed the relationship between the injuries level resulting from adverse working conditions, stress, fatigue, low labor protection employee training efficiency in the organization and the basic education of specialists responsible for labor protection. At the same time, the positive impact of basic specialized education and professional retraining increases if they are received on a full-time basis. To assess the labor protection specialist basic education impact to the injuries level, we assume that the maximum injuries level corresponds to the industrial accident victims number per 1000 employees and equal to 1.2 (according to Russian Federal State Statistic Service); the number of temporary disability man-days per 1 victim is 49.3 days; and the minimum average daily losses due to the employee absence at the workplace due to industrial injuries are 1812 conventional monetary units (c.u.) per day. We get the organization's minimum losses average value with the maximum injuries level equal to 107.198 c.u. Then the company's money savings due to the labor protection specialist's presence with the appropriate basic education can be represented by the values in figure 1.

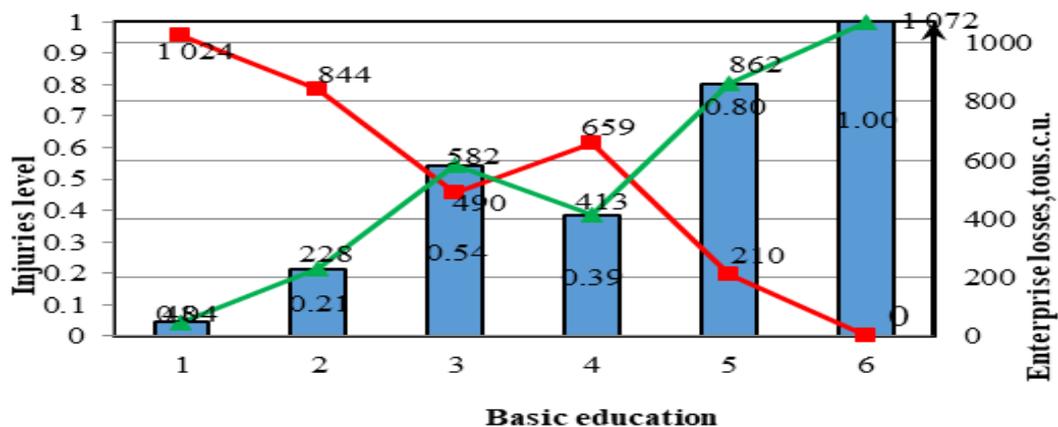


Figure 1. The occupational safety specialist education impact on losses as a result of injury: 1 – higher education in labor protection; 2 – higher education in the sciences; 3 – higher education in the humanities; 4 – Specialised secondary education in the sciences; 5 – specialised secondary education in the humanities; 6 – without full-time specialist

At the same time, economic losses (shown as a solid line) and, accordingly, savings (dotted line), due to industrial injuries, are shown only upon wage payment to absent employees and do not take into account all components of socio-economic losses in the company (downtime, retraining, lost profits, etc.) (Bakiko et al., 2020; Bakiko et al., 2019).

Thus, it is established:

1. Less than 16% of specialists have higher education in labor protection, 51% of specialists have higher education, but not specialized, and 29% have secondary vocational education;
2. 31% of specialists meet the necessary qualification requirements for Russia, and 12% meet the professional standard requirements. Lack of competent specialists in labor protection (more than 50%) is one of the main reasons for unsatisfactory labor protection and safety conditions in organizations;
3. The accidents frequency decreases with labour protection specialists professional competence level raising, increasing of work experience and additional competencies, subject to regular and effective training.

These factors affect the socio-economic consequences of unsatisfactory conditions, labor protection and safety, increase the social and labor relations effectiveness in labor protection;

4. Under the conditions of the digital economy the requirements for the labor protection specialists professional competence level are significantly increasing. They need not only specialized higher education, but also additional education that has a full range of new interdisciplinary technologies, including financial management and human resource management.

The economy digitalization creates new opportunities and sets new challenges for analysts and management in the field of labor protection. For example, to use a new analytical platform for managing strategic changes, which is used as the basis for the creating of managerial "holograms" that allow identifying new opportunities for enterprise development, it is necessary to spend money on improving the labor protection specialists competence (Dyukina et al., 2020; Merzlikina & Kozhanova, 2020).

The employer's expenses for training and maintaining a competent occupational safety specialist with systematic knowledge in this field contribute to improving production efficiency. These additional cross-disciplinary competencies will allow them to organize effective management taking into account the growing digitalization of occupational health and safety management technologies.

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