

The Role of Professional Competencies in Developing a Culture of Safety in the Workplace

By Sholpan K. Abikenova¹, Zhuldyz O. Oshakbayeva²,
Alimzhan B. Bekmagambetov³, Inara E. Sarybayeva⁴

Abstract

The paper considers the concept of occupational competencies as an integral part of building a culture of occupational safety in the organization. The paper provides examples of competencies that employees need to effectively perform their job safety responsibilities. It also discusses professional education and training issues related to the development of occupational safety competencies. It is believed that the development of occupational health and safety competencies not only influences the design of appropriate and safe working conditions, but also reduces the risk of occupational accidents and diseases. There are two types of occupational competencies: general and vocational. General occupational competencies are required for effective occupational activities to ensure safe work, regardless of the sector. The sectoral nature of occupational health and safety is reflected in the availability of specific occupational competencies.

The article discusses various methods and approaches for building a new national model for professional skills development. The model is based on the introduction of a risk-based approach in Kazakhstan. Occupational risk assessment is considered as the basis for designing training programs and acquiring the occupational competencies needed for comprehensive protection against risks. The development of a culture of occupational safety and professional competencies is a key factor in the sustainable development of the company and the improvement of the quality of life of its employees.

Keywords: safe work, risk-oriented approach, professional competencies, industrial accident, training programs.

1. Introduction

Occupational safety and health is one of the most critical areas of activity in any organization as it aims to ensure the safety and well-being of employees. Currently, there is an increasing focus not only on compliance with occupational safety norms and regulations but also on the development of a safety culture as a whole. Safety culture

¹Candidate of Physical and Mathematical Sciences, Associate Professor, General Director of the RSE with REM «Republican Research Institute for occupational safety and health of the Ministry of labor and social protection of the population of the Republic of Kazakhstan», Astana, Kazakhstan.

²Candidate of Biological Sciences, Associate Professor, Leading Researcher of the RSE with REM «Republican Research Institute for occupational safety and health of the Ministry of labor and social protection of the population of the Republic of Kazakhstan», Astana, Kazakhstan.

³Candidate of Legal Sciences, Associate Professor, Deputy Director General for Science of the RSE with REM «Republican Research Institute for occupational safety and health of the Ministry of labor and social protection of the population of the Republic of Kazakhstan», Astana, Kazakhstan.

⁴PhD student of L.N. Gumilyov Eurasian National University, Senior Researcher of the RSE with REM «Republican Research Institute for occupational safety and health of the Ministry of labor and social protection of the population of the Republic of Kazakhstan», Astana, Kazakhstan. (Correspondent author).

encompasses a complex system of values, norms, beliefs, and practices that are cultivated within an organization and influence employees' attitudes towards safety and well-being.

This scientific article will concentrate on the role of professional competencies in the development of a safety culture. Professional competencies encompass a combination of knowledge, skills, abilities, and qualities necessary for the effective performance of work tasks. They include not only technical knowledge but also skills in risk management, communication, leadership, analytical thinking, and others.

Understanding the importance of professional competencies in the context of occupational safety is becoming increasingly relevant in the modern world, where changing work conditions and new technologies impose higher demands on employees. The presence of necessary professional competencies among staff has a direct impact on the level of safety and health, as well as the overall effectiveness of an organization's operations.

The aim of this article is to examine the role of professional competencies in the development of a safety culture and explore ways to enhance and support them within the organizational environment. We will analyze existing research and practices, as well as provide recommendations for developing professional competencies that contribute to the improvement of worker safety and health.

2. Methodology

The methodology for developing and implementing risk-oriented models of occupational safety professional competencies considers international legal aspects in the context of ensuring workplace safety. The development of such models involves not only taking into account technical, economic, and social factors but also complying with international agreements and legislation in the field of workplace safety.

The methodology encompasses a complex set of measures and actions for the development and implementation of such models. Let's consider the key stages of the methodology, taking into account international legal aspects:

1. Analysis of international standards and legislation. This stage involves analyzing international standards in the field of workplace safety, such as those set by the International Labour Organization (ILO) and the United Nations (UN), as well as legislative regulations in different countries. During this stage, it is necessary to identify similarities and differences between international standards and legislation to ensure that the developed risk-oriented models comply with the requirements of international standards and legislation.
2. Identification of key aspects of the model. At this stage, the key aspects of the model are determined, such as risk identification, assessment of their impact on health and workplace safety, and the development of measures for their prevention and management. It is important to consider international standards and legislation when designing these aspects.
3. Model development and implementation. This stage involves the development of the model and its subsequent implementation in practice. International standards and legislation that require specific quality and workplace safety standards, as well as cultural

peculiarities and specificities of each country, should be taken into account during this process.

4. Monitoring and control. At this stage, monitoring and control of the effectiveness of the model's implementation and its compliance with international standards and legislation are conducted. If necessary, the model should be refined and improved based on the obtained results.

Thus, the methodology for developing and implementing risk-oriented models of occupational safety professional competencies should consider international standards and legislation in the field of workplace safety, ensuring that the developed models align with these requirements. This will help provide a safe and healthy working environment for all employees without exception.

3. Research area

Risk-oriented models of occupational safety professional competencies are an effective tool for ensuring workplace safety in various industrial sectors. However, their development and implementation must take into account international legal aspects and requirements related to workplace safety and health. The assessment and management of risks should comply with ILO standards and legislation regulating workplace safety, which will help ensure safe and compliant work practices (Ephremova, 2010).

The tables presented above reflect key international agreements and legislative acts that regulate workplace safety, as well as the requirements imposed on workplace safety and health. This information can be valuable in the development and implementation of risk-oriented models of occupational safety professional competencies and in the planning and evaluation of workplace safety within organizations.

The article addresses a relevant topic in the field of occupational safety. The authors correctly emphasize that the development and implementation of workplace safety models should take into account international standards and legislation to ensure the safety and health of workers.

One of the key points in this article is the analysis of international standards and legislation. As stated, during the analysis stage, it is important to identify the similarities and differences between international standards and legislation in order to ensure that the developed risk-oriented models comply with the requirements of international standards and legislation. This is a crucial aspect as each country may have its specific safety rules and regulations.

Another important point is the identification of key aspects of the model. The article correctly emphasizes that at this stage, it is necessary to consider international standards and legislation. This will enable the development of measures for risk prevention and management, ensuring that the model aligns with the requirements of international standards and legislation.

4. Analysis

The widespread occurrence of occupational risks can be attributed to the high level of development of industrial labor, where the extensive use of technology, chemicals,

biological substances, various forms of energy, and penetrating radiation leads to almost all areas of human activity (including non-production sectors) being permeated with risks. Many researchers argue that it is impossible for anyone to completely avoid risky situations in the process of work in the field of material production today (Kibanov, 2017).

The identification of factors of occupational risk, the study of their safe (and hazardous) levels of impact on workers, monitoring of health and safety in workplaces, organization of research on accidents and occupational diseases, and a range of other issues fall within the scope of tasks related to the assessment and management of occupational risks. The relevance of assessing and managing occupational risks in Russia is currently sharply increasing. This is partly due to the establishment of insurance mechanisms for mandatory social insurance against industrial accidents and occupational diseases, as well as the formation of mandatory occupational pension systems.

Identifying the probability of occupational risks occurring over time and determining the severity of their consequences for specific groups of workers and individual employees allows for taking preventive measures and minimizing risks. It enables an actuarial assessment of the volume of financial insurance resources required for compensating wage losses and financing medical, health, and rehabilitation measures. In this regard, the foreign experience in assessing and managing occupational risks for workers in the workplace is particularly instructive (Crouch, 2018).

In the modern world, workplace safety is one of the main priorities for organizations. In order to ensure a safe and healthy environment for employees, risk-oriented models of professional competencies in occupational safety are increasingly being used in various industries. However, in addition to assessing risks and addressing workplace issues, it is also necessary to consider the international legal aspects of workplace safety, which are regulated by international agreements and legislation.

One of the most important international agreements regulating workplace safety is the International Labour Organization (ILO) Occupational Safety and Health Standards. The ILO sets standards for health and safety at work, as well as requirements for equipment and working conditions to protect employees from workplace hazards. Table 1 provides an overview of the key international documents regulating workplace safety.

Table 1. Main international documents regulating workplace safety

Document Title	Content
International Labour Organization (ILO) Occupational Safety and Health Standards	Standards for occupational health and safety, requirements for equipment and working conditions to protect employees from workplace hazards.
European Agreement on Safety and Health at Work	Establishes minimum requirements for ensuring safety and health of workers in Europe.
International Labour Organization Convention on the Control of Hazardous Substances	Sets requirements for the control of hazardous substances and regulates the use of such substances in the workplace.

Furthermore, various countries have their own legislative acts that regulate workplace safety and health. Table 2 provides examples of such legislative acts in several countries.

Table 2. Examples of legislative acts regulating workplace safety in various countries

Country:	Legislative Act:
USA	OSH Act (Occupational Safety and Health Act)
United Kingdom	Health and Safety at Work Act
Germany	Arbeitsschutzgesetz (Occupational Safety and Health Act)
France	Code du travail (Labor Code)

Risk-oriented models of occupational safety competence enable organizations to effectively assess workplace risks and implement measures to mitigate those risks. However, in order to ensure compliance with international treaties and legislation on workplace safety, it is also necessary to consider their requirements in the development and implementation of these models.

Table 3 presents the key principles of workplace safety and health established by international treaties and legislation.

Table 3. Basic principles of safety and health in the workplace, established by international treaties and legislation

Principle	Description:
Prevention of hazards	Employers must prevent hazards in the workplace and ensure safe working conditions.
Mandatory use of personal protective equipment	In cases where it is not possible to completely eliminate hazards in the workplace, the use of personal protective equipment is necessary.
Provision of qualified security specialists	Employers must ensure the presence of qualified safety specialists in the workplace.
Employee education and training	The employer must train and educate their employees in the field of safety and health in the workplace

Non-compliance with international agreements and legislation regulating workplace safety can lead to legal claims from governments and organizations, as well as serious consequences such as financial sanctions and losses for the organization. Therefore, when developing and implementing risk-oriented models for occupational safety, it is necessary to consider the international legal aspects and requirements imposed on workplace safety. Table 4 presents the main requirements of the International Labour Organization (ILO) for workplace safety and health.

Table 4. Key requirements of the International Labour Organization (ILO) for workplace safety and health

Requirement	Description
Provision of safe working conditions	The employer must provide safe working conditions for their employees.
Training and education	The employer must train their employees in the fundamentals of workplace safety and health.
Use of personal and collective protective equipment	The employer must ensure the use of personal and collective protective equipment to protect against hazards.
Medical examinations	The employer must conduct regular medical examinations for employees working in high-risk conditions.

Risk-oriented models of professional competencies in occupational safety are an effective tool for ensuring workplace safety in various industrial sectors. However, when developing and implementing these models, it is necessary to consider international legal aspects and requirements related to safety and health in the workplace. Risk assessment and management should comply with ILO standards and legislation regulating workplace safety, which will help ensure safe and compliant work practices.

The aforementioned tables reflect the key international agreements and legislative acts governing workplace safety, as well as the requirements pertaining to safety and health in the workplace. This information can be valuable for developing and implementing risk-oriented models of professional competencies in occupational safety, as well as for planning and evaluating workplace safety in organizations.

5. Results

According to the Concept of Safe Work in the Republic of Kazakhstan until 2030, the separation of training and knowledge assessment procedures in the field of occupational safety is envisaged. This includes conducting advanced courses on safety and occupational health for managers and responsible personnel, as well as the implementation of an online knowledge assessment platform. In this regard, the establishment of a Unified Educational and Methodological Center is planned. This center will be responsible for developing standardized educational programs, educational and methodological complexes, and assessment tools for each program. It will also maintain lists of training centers, knowledge assessment results, instructors, and other relevant information. This approach will enable the monitoring of the quality and completeness of the adopted standard training programs by the participants and increase the accountability of the training centers. Additionally, it will allow ranking of the training centers and the teaching staff through the lists.

The upcoming changes in the training and professional development system will primarily focus on enhancing the competencies of managers in the field of occupational safety. A program will be developed to enhance managerial competencies in occupational safety, including leadership in safety, setting occupational safety strategies, demonstrating commitment, and other relevant skills that contribute to the development and improvement of a safety culture.

Furthermore, educational programs will be designed with a risk-oriented approach, taking into account specific professional competencies and considering the industry-specific requirements Figure 1.

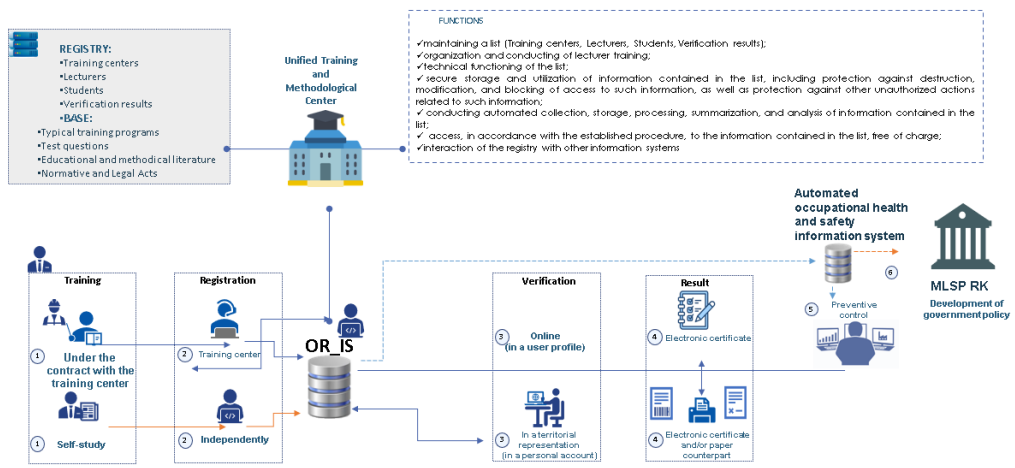


Figure 1. Model for the development of competencies in the field of occupational safety and health

* Source: compared by authors

In addition to categorizing training programs, special attention will be given to elevating the status of occupational safety specialists. The requirements for their professional training will be raised.

New requirements will be introduced for individuals entering the profession of occupational safety engineer without a category, which will include mandatory completion of qualification enhancement courses of at least 72 hours in training centers or vocational training facilities at enterprises.

To enhance the quality of education, requirements will be implemented for the teaching staff of training centers, who will undergo mandatory training through a specialized preparation program. After completing the training and passing a two-stage examination, they will be included in the List of Certified Lecturers maintained by the Unified Educational and Methodological Center.

In the process of a comparative analysis of regulatory norms regarding the development of professional competencies, active in Kazakhstan, in the field of occupational health and safety, which includes workplace safety and hygiene, the following regulatory norms related to training have been identified:

The presence of an authorized body for coordinating the activities of training centers (TCs).

Regulatory documents (licensing, accreditation, notification, etc.) for the type of educational activities.

The existence of a unified educational platform, including:

- Maintenance of a centralized database for knowledge assessment and certificate issuance;
- Maintenance of a unified list of instructors (authorized on the educational platform);
- Maintenance of a unified list of TCs (authorized on the educational platform).

Types of programs for qualification enhancement, their titles, and the number of hours.

Categories of subjects subject to mandatory training and knowledge assessment.

For each of these five regulatory norms, the international experience of countries such as Germany, Japan, the USA, and the UK has been analyzed in comparison with the norms effective in Kazakhstan.

Specifically, it has been established that in Germany and the USA, categories of subjects required to undergo mandatory training and knowledge assessment are enshrined in legislative procedures. Their coverage is notably extensive. In Kazakhstan, the obligation for training and knowledge assessment is also legislated and is mandatory for employees, managers, and individuals responsible for ensuring workplace safety and occupational health (WSOH). Nevertheless, in Kazakhstan, the employer independently determines the list of individuals responsible for WSOH, often without ensuring that these individuals acquire the necessary level of knowledge about occupational health and safety.

Moreover, the national models for developing professional competencies in advanced countries are characterized by stringent regulatory policies. Most frequently, this involves the compulsory licensing of commercial educational centers (Germany) and mandatory or voluntary accreditation (USA). In Kazakhstan, the absence of even considering TCs, their material and technical resources, lecturer qualifications, and static data about their activities often leads to formalistic training.

In the investigated countries, obligatory lists/registries of specially trained OSH instructors with mandatory registration are maintained. For instance, in Germany, this is done through the German Social Accident Insurance (DGUV), while in the USA, it is managed by the Occupational Safety and Health Administration (OSHA).

Furthermore, it's worth noting that the development of professional competencies in the field of occupational health and safety is funded differently in these countries. In Germany, funding is derived from insurance contributions from sector-specific nonprofit organizations. In the USA, it is financed by employers and through governmental grant programs like NIOSH, including its educational branches. In Kazakhstan, training is exclusively financed by employers.

6. Conclusions

Article explores the concept of occupational competencies and its significance in fostering a culture of occupational safety within organizations. The authors highlight the essential competencies that employees should possess to effectively fulfill their job responsibilities related to safety. The article also addresses the importance of professional education and training in developing occupational safety competencies. The development of these competencies not only contributes to the establishment of appropriate and safe working conditions but also reduces the occurrence of occupational accidents and illnesses.

The article distinguishes between two types of occupational competencies: general and vocational. General competencies are necessary for ensuring safe work practices across different sectors, while vocational competencies are tailored to specific occupational health and safety requirements.

Furthermore, the article discusses various methods and approaches for implementing a new national model for developing professional skills, with a focus on a risk-based

approach adopted in Kazakhstan. Occupational risk assessment serves as the foundation for designing training programs and acquiring the necessary competencies to comprehensively manage risks. Developing a culture of occupational safety and fostering professional competencies are crucial for the sustainable growth of companies and the enhancement of employees' quality of life.

In summary, this article emphasizes the significance of occupational competencies in cultivating a culture of occupational safety, and it proposes the implementation of a risk-based approach to skill development in Kazakhstan. The promotion of occupational safety culture and the acquisition of relevant competencies are fundamental for the long-term success of organizations and the well-being of their employees.

In conclusion, this scientific article sheds light on the paramount significance of occupational safety and health within organizational contexts, emphasizing the evolution towards cultivating a safety culture. This culture encompasses a holistic system of values, norms, beliefs, and practices that profoundly influence employees' attitudes towards safety and well-being.

The focus of this article was to underscore the pivotal role of professional competencies in fostering a safety culture. These competencies encompass a blend of knowledge, skills, abilities, and qualities essential for effectively carrying out work tasks. They extend beyond mere technical proficiency, encompassing risk management, communication, leadership, analytical thinking, and more.

In the contemporary landscape, where evolving work conditions and novel technologies heighten demands on employees, the significance of professional competencies within the context of occupational safety becomes increasingly apparent. The presence of well-rounded professional competencies directly influences both the level of safety and health within the workplace and the overall efficiency of an organization's operations.

The primary objective of this article was to explore the multifaceted role of professional competencies in nurturing a safety culture and offer insights into enhancing and supporting these competencies within organizational environments. By delving into existing research and practices, the article aimed to provide recommendations for developing professional competencies that contribute substantively to the enhancement of worker safety and health.

The methodology outlined in the article for developing and implementing risk-oriented models of occupational safety professional competencies constitutes a comprehensive framework that aligns with international legal aspects. By meticulously analyzing international standards and legislation, identifying key aspects of the model, developing and implementing the model, and exercising monitoring and control, organizations can craft effective strategies that integrate seamlessly with global standards.

Additionally, the article effectively underscores the importance of international agreements and legislative acts governing workplace safety. It accentuates the necessity of conforming to these regulations when formulating risk-oriented models of occupational safety competencies. Compliance with these standards is not only ethically imperative but also crucial for avoiding legal implications and financial losses.

The proactive approach taken by the Republic of Kazakhstan in ensuring workplace safety by separating training and knowledge assessment procedures, establishing a Unified Educational and Methodological Center, and elevating the status of occupational safety

specialists is commendable. This forward-looking strategy aligns with the overarching goal of improving workplace safety and nurturing a culture of well-being.

In essence, this article serves as an invaluable resource for practitioners, policymakers, and researchers alike, offering comprehensive insights into the interplay between professional competencies, workplace safety, and the development of a safety culture. As organizations continue to evolve and adapt to changing paradigms, the integration of robust professional competencies within the realm of occupational safety remains an essential facet of promoting employee welfare and organizational success.

Acknowledgements: The research results were obtained within the framework of the scientific and technical program on the topic «Risk-oriented organizational-economic mechanisms of safe work in conditions of modern Kazakhstan» (OR11865833).

References

Order of the Minister of Health and Social Development of the Republic of Kazakhstan dated December 25, 2015, No. 1019 "On Approval of Rules and Timeframes for Training, Instruction, and Knowledge Assessment in the Field of Occupational Safety and Health for Employees."

Labor Code of the Republic of Kazakhstan, Code of the Republic of Kazakhstan dated November 23, 2015, No. 414-V ZRK.

What requirements must an organization meet to conduct professional development on occupational safety and health? Source: cdb.kz: <https://cdb.kz/sistema/pravovaya-baza/kakim-trebovaniyam-dolzha-sootvetstvovat-organizatsiya-dlya-osushchestvleniya-povysheniya-kvalifika/>

Termination of an employee for violating safety regulations: <https://defacto.kz/ru/content/uvolnenie-rabotnika-za-narusenie-pravil-bezopasnosti>

Matyunina M.V., Yu. Dyrchenkova.A. Analysis of the composition and structure of income and expenses of the Social Insurance Fund of the Russian Federation, Doi: 10.24412/2308-264X-2021-3-175-183

Liang, H.; Zhang, S.; Su, Y. The structure and emerging trends of construction safety management research: A bibliometric review. *Int. J. Occup. Saf. Ergon.* 2020, 26, 469–488.

Gou, X.Q.; Liu, H.; Qiang, Y.J.; Lang, Z.H.; Wang, H.N.; Ye, D.; Wang, Z.W.; Wang, H. In-depth analysis on safety and security research based on system dynamics: A bibliometric mapping approach-based study. *Saf. Sci.* 2022, 147, 105617.

<https://cdb.kz/sistema/pravovaya-baza/kakov-poryadok-provedeniya-obucheniya-i-proverki-znaniy-otvetstvennykh-rabotnikov-po-voprosam-bezopa/> (What is the procedure for training and knowledge assessment of responsible employees in the field of occupational safety and health?)

Directive 89/391/EEC of the Council of June 12, 1989, "On the introduction of measures to encourage improvements in the safety and health of workers at work." [Electronic resource] - URL: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:1989:183:0001:0008:EN:PDF>.

Law on the implementation of occupational safety measures to improve the safety and health protection of employees at work, *Bundesgesetzblatt*, 1996. [Electronic resource] - URL: <http://www.gesetze-im-internet.de/arbSchg/ArbSchG.pdf>.