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OCCUPATIONAL SAFETY ENGINEERS: FROM IDENTITY CRISIS TO RECOGNIZED PROFESSION

Abstract: *This paper, beginning with a historical overview of the evolution of the occupational health and safety engineering profession, examines the characteristics of recognized professions and, based on this discourse, outlines the challenges and offers recommendations for the development of identity and formal recognition of the occupational health and safety engineering profession in contemporary social and economic contexts. These observations collectively suggest that the field of safety is still facing challenges in defining its core purpose and clarifying its professional identity. The article proposes strategies for addressing this identity crisis. In particular, the author explores the potential role of education and certification in facilitating the professional maturity of OSH and achieving the recognition it seeks as a fully acknowledged profession.*

Keywords: profession, engineers, occupational safety and health

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INSTEAD OF INTRODUCTION – A REVIEW OF THE DEVELOPMENT OF THE OCCUPATIONAL HEALTH AND SAFETY ENGINEERING PROFESSION

Since their inception, professions have represented the intellectual elite and the developmental potential of society. The current standing of professions is influenced by the socio-cultural context in which they are viewed. In terms of definition, a profession resists simplistic interpretations and should not be confused with the concept of an occupation. Various sociological analyses (structural, process, causal, and functional) have focused on identifying the characteristics of professions, as well as the processes of professionalization - specifically, the emergence of a profession or the transformation of a particular occupation into a recognized profession. Not all occupations qualify as professions. Occupations tend to rely on routine practices to enhance work quality. Professions, however, do not operate on routine, as it signifies the onset of professional degradation or deprofessionalization. Professions are built on theoretical knowledge; work involves problem-solving through the application of complex scientific and theoretical frameworks. Therefore, it can be concluded that a profession requires a specialized set of knowledge, skills, and competencies gained through formal education courses.

Historically, courses in occupational safety are mentioned in literature dating back to the 19th century. In France, Germany, and the Netherlands[1] safety museums were created with the primary aim of spreading the idea of safety and, later, implementing targeted educational programs (Swuste et al., 2010). In the Netherlands, the government initiated the introduction of educational programs for safety professionals, while the Safety Museum organized and conducted programs for employers, employees, and government officials from labor inspectorates[2]. Prior to World War II, occupational safety and health content was rarely included in university education, mainly at medical faculties, at the postgraduate level for doctors specializing in dermatology or respiratory medicine. In technical schools, only safety aspects related to machine maintenance and operation were covered.[3] The Second World War contributed to the growth of the military industry, along with a rise in workplace injuries and industrial accidents, which triggered the need for education in the field of occupational safety and health[4].

In the second half of the 20th century, higher education and professional training for occupational safety and health specialists expanded in Europe and the United States. In Europe, the first courses in occupational safety and health were introduced at institutions like Delft University of Technology in the Netherlands, The Wuppertal University in Germany, Aston University in Birmingham, and Imperial College London in the UK, as well as in Finland and Stockholm (Hale and Kroes, 1997). Soon after, the network of higher education

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[1] In the Netherlands, the Safety Museum was established in 1893.

[2] The first such course was organized in 1951.

[3] ILO Encyclopedia, Geneva, 4th edition, Volume I, Ch.18.

[4] After World War II, the problems were particularly prevalent in countries that gained independence as colonies of European nations and began rapid industrialization.

institutions offering programs in this field spread across various U.S. states and Australia, including Federation Ballarat University (Ibid.).

During this time, the Republic of Serbia and the former SFRY underwent a rapid shift from an agrarian to an industrial economy and urban lifestyle, leading to significant challenges in the working and living environment. The high number of workplace injuries, occupational diseases, disabilities, material losses, and other environmental damages across the Republic of Serbia and the former SFRY led to the implementation of legal regulations. This resulted in the creation of various professional (research institutes) and educational and scientific institutions (universities and colleges) dedicated to training specialists in this field (Nikolic et al. 2018)

A comparative analysis of national and international documents and relevant literature reveals the diversity of approaches to the profession of Occupational Safety Engineering. This situation can be attributed to both national particularities (Verbeek, Kroon, 1995) and differences in legal frameworks, variations in higher education institutions and curriculum designers, as well as distinct cultural perspectives on occupational safety and health (Swuste and Arnoldy, 2003).

METHODOLOGY

Given the vital role of the Occupational Health and Safety Engineering profession in enhancing occupational safety and health systems and, more broadly, in the advancement of the field of occupational safety, it is perplexing that so few studies and papers are available on this subject. Some authors (Verbeek and Kroon, 1995) point to the lack of popularity of this research topic, as well as the relatively low quality of research in this domain. Safety research was predominantly descriptive and lacked in-depth analysis (Gute et al., 1993). This shifted in the 1980s, a decade marked by several catastrophic accidents in high-tech, high-risk sectors. The 1990s saw a continuous production of scientific papers on (post)academic safety education. A review of the literature suggests that most studies in this area focus on worker safety training issues (Elangovan et al., 2005.). When it comes to higher education, research primarily deals with discussions on the inclusion of occupational safety content in university curricula (Hil and Nelson, 2005,); the integration of safety into engineering education (Culvenor and Else, 1997), or the analysis of the content of existing study programs in this field (Toft et al., 2003; Rouhof et al., 2009, etc.).

This research focuses on the profession of Occupational Health and Safety Engineering, aiming to analyze the current status of the profession and to develop strategic directions for its future growth. The study begins by exploring the factors contributing to the identity crisis of Occupational Health and Safety Engineers and continues by examining the characteristics of regulated and recognized professions, ultimately identifying guidelines for establishing a

professional identity for Occupational Health and Safety Engineers in the future. The research approach led us to use a descriptive research method, incorporating various data collection techniques. The data collection process involved conducting an internet/desktop study followed by interviews with relevant informants, including representatives of employers, occupational safety associations, and engineering faculties offering accredited study programs in this field. Interviews were carried out either *face-to-face* or via phone. During the data analysis and result interpretation phase, a comparative analysis was applied, comparing insights gathered from the interviews with official documents, curricula, and other published and accessible sources.

RESULTS AND DISCUSSION

The identity crisis of occupational safety engineers

Historical analyses in the introductory section have indicated that for over half a century, both in Europe and the U.S., as well as in Serbia, specialists in occupational health and safety have been trained at the higher education level, with the profession in this field continuously evolving. The establishment of this profession was preceded by the introduction of legislation that legally regulated occupational safety. However, students, their parents, and the broader public remain uncertain about the actual roles and responsibilities of these professionals.

Referring to Maslow's hierarchy of needs, it is evident that the need for safety is a fundamental human need, which, according to Maslow, comes immediately after basic existential needs.
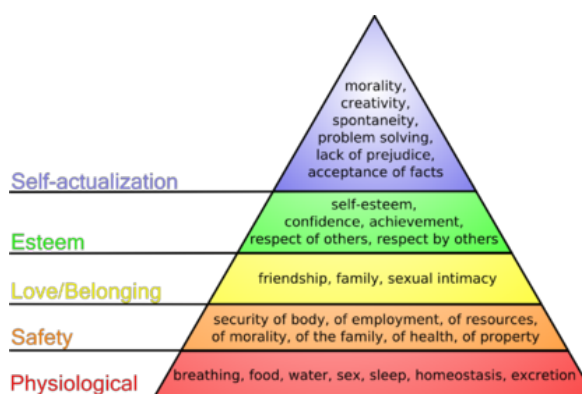

Figure 1. *Maslow's hierarchy of needs*

Although the need for safety, security, and protection has been a defining human need throughout the history of human civilization, the profession of occupational safety and health engineering continues to experience an identity crisis. Unlike doctors, lawyers, and other "recognized" professions, the occupational safety engineering profession is not properly acknowledged or valued. This situation can be attributed to the absence of a universally accepted definition of a "**safety professional**." One might expect clarification from

various safety organizations, but this has not materialized. We believe that the explanation lies in the complex and multidisciplinary nature of the field of safety, which includes various specializations working on diverse tasks across different organizational levels.

Distinction of basic concepts – profession, occupation, qualification

In everyday language, the term *"profession"* has slightly shifted in meaning, enough to no longer represent its original concept. By precisely defining the term "profession" and accurately identifying the concept it refers to, we not only clarify the terminology but also address the significant social implications of its use in daily life.

In everyday language, the terms *"profession"* *(lat.professio[5])* and *"occupation"* are frequently used interchangeably, often conveying the same or similar meaning. It is uncommon for "occupation" to denote a current job, whereas "profession" typically refers to a job for which an individual has received education and certification. The scientific literature contains numerous studies examining the distinctions between these concepts. According to Huntington (2004:10), three interrelated and essential attributes of a profession should be highlighted: expertise, responsibility, and group membership.

According to the Australian professional organization (Professions Australia, 2010), a profession is defined as a disciplined group of individuals who adhere to ethical standards and are recognized by the public for their specialized knowledge and skills, which are acquired from a recognized educational institution. These competencies are grounded in research, education, and training at the higher education level, and professionals are committed to applying their expertise for the benefit of others. This definition underscores the importance of ethical conduct, specialized knowledge and skills, a scientific basis, and a commitment to societal welfare.

Every profession undergoes its own "*life cycle.*" The development of existing professions or the emergence of new ones is influenced by new research, the expansion of the scientific knowledge base, technological innovations, patents, solutions, and new procedures. A profession is established, grows, evolves, and matures. When a profession grows and matures, it is acknowledged as a distinguished profession by its practitioners. Thus, it can be inferred that the development of a profession necessitates specialized knowledge and skills that fundamentally define it. Additionally, the enhancement of professionals' knowledge base requires education and continuous professional development.

Unlike qualifications, which are earned through formal education, an **occupation** is gained through work

experience. An occupation encompasses a set of jobs[6] and tasks (positions) that are so similar and interconnected in their content and type, both organizationally and technologically, that they are performed by an individual with the appropriate knowledge, abilities, and skills. According to the Law on the National Qualifications Framework of the Republic of Serbia, **an occupational standard** is a document that outlines the duties and tasks, as well as the competencies required for an individual to efficiently perform jobs in a specific occupation, established in accordance with employment regulations.

Considering the focus of our research, we must ask: What is the primary distinction between an occupation and a profession? Is a safety engineer considered a profession or an occupation? An occupation can be seen as a collection of activities and tasks performed to earn a living. In contrast, **a profession** requires specialized knowledge and skills that are applicable in its practice and provide the professional with an advantage in decision-making (Star, 1984). To be regarded as a professional, one must work in a recognized profession, possess the necessary knowledge, skills, and abilities, or competencies, and hold the appropriate qualifications.

According to the Law on the National Qualifications Framework (NOKS)[7], **a qualification** is the formal acknowledgment of acquired competencies[8]. An individual attains a qualification when the relevant authority verifies that they have met the learning outcomes[9] at a specific level and in accordance with the established qualification standard, which is validated by an official document (diploma or certificate). The same law defines **a qualification standard** as a document that outlines the objectives and learning outcomes, along with information about the qualification, which is used to determine its level, classification, and evaluation (Ibid).

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[5] The term "profession" originates from the Latin word professio and denotes an occupation, vocation, or activity. Along with "profession," the following terms are commonly associated: "professional," "specialist," and "expert."

[6] A job (position) is defined as a set of work tasks performed by one person. Data on organizationally and technologically related jobs or positions are grouped into occupations.

[7] *Competence* – An integrated set of knowledge, skills, abilities, and attitudes that enable an individual to act effectively in accordance with the qualification standard.
Key competences for lifelong learning – The ability to use acquired knowledge, skills, and attitudes necessary for personal, social, and professional development and further learning. These competences are embedded in the objectives and standards at all levels of education as new areas relevant for the continuous acquisition of competences, managing private and social life, professions, and navigating real-world problems and demanding situations.

[9] *Learning outcomes* – Clear statements about what an individual is expected to know, understand, and be able to demonstrate or perform after completing a learning process. They enable the verification of the level of competence development, as well as the achievement of knowledge, skills, attitudes, and abilities.

Characteristics of recognized professions

Historically, the evolution of professions in their modern form is associated with the establishment of universities and the secularization of knowledge. The earliest professions, such as medicine and law, emerged in the 16th century from occupations requiring university education. Given the limited access to higher education at that time, it can be inferred that membership in a profession was a privilege determined by birth (social status) rather than by knowledge and skills. This historical context explains the exclusivity of professional membership and the efforts to establish various conditions to maintain its power and privileges.

The professionalization of contemporary societies involves the transformation of occupations, existing professions, and inter-professional dynamics into new professions. An occupation evolves into a profession when it sufficiently develops and systematizes a body of theoretical knowledge and techniques to deliver a specific professional service. The institutional basis for the formation of a profession is the establishment of higher education institutions that cultivate and disseminate knowledge. Professions subsequently form professional associations and establish ethical codes to govern their practices. This process culminates in the legitimization and often legal endorsement of a monopoly over the provision of professional services. The extent to which these aspects are developed contributes to the degree of societal recognition of a profession.[10]

Broadly speaking, **the recognition of professions and professional qualifications** enables the employment and mobility of the workforce within the EU[11], and globally. According to the Professional Qualifications Directive 2005/36/EC, seven professions are recognized as regulated[12] across all EU member states: doctors,

nurses, dentists, veterinarians, midwives, pharmacists, and architects. The updated 2013 version of this directive introduced principles of reciprocity and mutual recognition, along with a framework for mutual evaluation based on training. These documents govern access to labor markets in EU countries. Each country retains the right to create its own list of regulated professions, while the directives standardize the regulation of the aforementioned professions across the EU.

The Republic of Serbia has enacted the Law on Regulated Professions and Professional Qualifications ("Official Gazette of RS", No. 66/2019), which will take effect upon the country's accession to the European Union. This law establishes the general system for the recognition and automatic recognition of qualifications. The adoption of this law completes the transposition of Directive 2005/36/EC, its amended version from 2013, and Regulation 1024/2012 on administrative cooperation through the Internal Market Information System.

The referenced documents primarily outline a framework for recognizing regulated professions within the EU, with provisions for extending this recognition under specific conditions to other countries, including the EEA and Switzerland. Achieving the status of a regulated profession, or even gaining broader social recognition for a profession, is a complex process. Credible sources highlight the attributes that are typically associated with regulated and well-established professions (*Dean,* 1995.):

- **Service Orientation & Code of Ethics** - The majority of regulated or recognized professions deliver essential services to society, prioritizing the public good over ersonal interests and operating in alignment with their professional code of ethics[13].

- **Specialized Body of Knowledge** - A profession is founded on specialized expertise and competencies. Professionals acquire and refine these skills and knowledge through dedicated education and training to provide effective service to their clients.

- **Academic Education/Qualification** as a condition sine qua non of recognized professions

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[10] Professions can be divided into three groups:
- *Classical professions* (doctors, lawyers, professors), characterized by high authority based on knowledge and autonomy in decision-making.
- *Professions that emerged later as a result of industrialization* (engineers).
- *Paraprofessions* (teachers, nurses, social workers), which typically require shorter education, have less clearly defined fields of activity, are tied to bureaucratic hierarchies, and have limited autonomy in decision-making.

[11] The Treaty on the Functioning of the EU guarantees the free movement of workers and services, as well as the freedom of establishment within the EU's single market. These rights allow all EU citizens, whether employed by someone else ("workers") or self-employed, to move freely between member states for professional purposes. These rights are part of the four fundamental freedoms in the EU (free movement of goods, services, capital, and labor).

[12] According to the Law on Regulated Professions and Professional Qualifications (Official Gazette of the Republic of Serbia, No. 66/2019), a regulated profession is a professional activity or a set of professional activities where access to and performance of the activity, or the way the activity is carried out, is directly or indirectly conditioned by possessing certain professional qualifications, based on legal,

sublegal, or other acts adopted under legal authority. It also refers to professional activities or a set of professional activities carried out by members of professional organizations with a professional title. As a rule, a profession is considered regulated if the prerequisite for working in that profession is the possession of a specific diploma, the passing of a special exam such as a state exam, and/or registration with a professional body. A professional qualification includes completed formal education and additional professional training and development carried out during or after the completion of formal education, and is evidenced by a diploma or other official document issued by the relevant educational institution.

[13] It defines socially acceptable and desirable behavior when performing a professional activity.

- The prestige and status of a profession, along with its knowledge base, are elevated through rigorous educational standards. A particularly significant feature of academic education in recognized professions (e.g., medicine, law) is the inclusion of extensive internships, clinical training, or other culminating off-campus experiences. These opportunities enable students to apply their specialized knowledge and skills in real-world settings under the guidance of more experienced professionals.

- **Continuous Learning and Professional Development -** Following the completion of higher education programs, professionals pursue ongoing development of their knowledge and skills through various informal and non-formal educational avenues, such as seminars, symposiums, and conferences. At the same time, the exchange and dissemination of professional knowledge enhance the intellectual capital of the profession. This, in turn, strengthens the scientific foundation of the field, enabling timely responses to new professional challenges. Such continuous development is particularly crucial for Occupational Health and Safety Engineers, as it fosters their broader recognition and appreciation.

- **Socialization/Collegiality**
Professional socialization refers to the process of forming a group identity or collegial consciousness. Professionals gain membership in the group through alignment with the values, practices, and personal identity of the profession. Moreover, a profession may implement licensing, certification, or other means of affirming professional identity. **By doing so, governments formally acknowledge the validity of entering the profession by certifying membership and legally** preventing non-professionals from practicing. (Dean, 1995)

Barriers to the development of the occupational health and safety engineering profession identity

There are several limitations and obstacles in the process of recognizing and developing the identity of Occupational Health and Safety Engineers, which contribute to the fact that occupational safety and health is not yet widely acknowledged as a profession.

One of the primary issues is that the field of occupational safety and health has not established the necessary requirements for recognizing appropriate academic qualifications and certifications, meaning that Occupational Health and Safety Engineers still lack priority and exclusivity in practicing their profession. This has resulted in a blurred distinction between qualified professionals and those without the necessary qualifications, who have found opportunities in this field. Consequently, a significant number of outsiders, amateurs, and unqualified individuals have been employed in occupational safety and health roles. To

draw a parallel with the medical profession, one might ask: can a person be a doctor without completing medical school (an accredited medical education program) or a lawyer without graduating from law school?

Furthermore, it is not uncommon for employers to designate, or rather "transform," an existing employee into the person responsible for occupational safety and health without the requisite academic qualifications or necessary certifications. Can such an individual be trusted to assess risks and determine what is safe or unsafe in the workplace? Would society accept someone without medical education and the proper specialization performing surgeries on people? Therefore, it is crucial to create barriers that prevent "outsiders" and amateurs from entering this profession permanently.

External sources highlight that academic programs are frequently not accredited, or employers may not require specific accreditation or certification to perform these duties. Additionally, in many countries, there are no defined or adopted qualification standards as fundamental components for developing academic programs in this field. From these considerations, it can be concluded that the professionalization of occupational safety engineering, and the recognition and development of the professional identity of Occupational Health and Safety Engineers as they progress toward becoming a regulated profession, involves the following:

Defined and Established Qualification Standard for Occupational Health and Safety Engineers with Clearly Defined Competencies Achieved Through Accredited Higher Education Programs;

For the profession of Occupational Health and Safety Engineer to be recognized and regulated, it is crucial to clearly define the qualification standard for Occupational Health and Safety Engineers. In line with the qualification framework outlined in the Law on NOKS, the qualification of an Occupational Health and Safety Engineer represents formal recognition of competencies gained through academic or vocational higher education in the field of Occupational Safety Engineering. The profession's status and its knowledge base are advanced through the qualification standard, which serves as the primary input for designing academic programs. An individual is awarded the qualification when the relevant authority confirms that they have met the learning outcomes[14] for a particular level and in accordance with the qualification standard, as evidenced by an official document (such as a diploma or certificate). According to the same law, the qualification standard is a document that describes the

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[14] Learning outcomes – Clear statements about what an individual is expected to know, understand, and be able to demonstrate or perform after completing a learning process. They enable the verification of the level of competence development, as well as the achievement of knowledge, skills, attitudes, and abilities.

objectives and learning outcomes, as well as details about the qualification, which are used to establish its level, classification, and evaluation.

Establishing Clear Criteria to Differentiate Between Qualified and Unqualified Individuals *(determining barriers to ''entry'' into the Profession);*

Establishing Professional Associations *(facilitating professional socialization and fostering collegiality);*

Establishing a System for Informal Education *(continuous improvement of knowledge and skills for their members;*

Continuous Professional Development *of Members Outside of University through Informal Education Formats (in Compliance with Regulations)*

A review of relevant literature and practical experience indicates that Occupational Health and Safety Engineers have well-established and active associations. Many of these associations organize conferences, seminars, and other informal professional development opportunities for their members, or serve as publishers of professional journals and other technical literature in the field (for example, The European Society of Safety Engineers, ESSE).

Guidelines and recommendations for the recognition of the OSH profession

On the path to becoming a recognized OSH profession, several areas should be considered in order to be regarded as a profession.

The Role of Education – Formal education equips individuals with specialized knowledge and valuable learning experiences necessary for obtaining an academic qualification. As previously stated, the profession must clearly outline the fundamental knowledge, specific professional skills, competencies, and outcomes that graduates of an accredited Occupational Health and Safety program are expected to attain.[15]

The specific program outcomes identified by ASSE (2004) include the ability of graduates to:

- Anticipate, recognize, assess, evaluate, and develop control strategies for hazardous conditions and work practices;

- Demonstrate the application of business and risk management concepts;

- Understand fundamental aspects of safety, industrial hygiene, environmental science, fire science, hazardous materials, emergency management, ergonomics, and/or human factors;

- Design and evaluate SH&E (Safety, Health, and Environment) training programs;

- Apply adult learning theory to safety training methodology;

- Identify and apply applicable standards, regulations, and codes;

- Conduct accident investigations and analyses;

- Apply principles of safety and health in a non-academic setting through an internship, cooperative, or supervised experience.

Certainly, this is not an exhaustive list of the topics and issues present in occupational safety and health practice. Today, in the era of digitalization, occupational safety and health converges with various challenges in the workplace environment. However, these outcomes provide a framework for the fundamental knowledge and skills that graduates of a bachelor's program should be expected to possess.

Professional Degree Integrity - As formal higher education is a vital means of acquiring a specialized set of professional knowledge and skills, how can we differentiate quality programs from subpar ones? With limited regulatory bodies overseeing continuous education in occupational safety and health, there is a risk that questionable academic courses could be offered. The notion that anyone can create and offer a Safety program undermines the profession's credibility. The Council for Higher Education Accreditation (CHEA, 2009) addresses such questionable program providers. Thus, maintaining the integrity of professional degrees is crucial for a profession's ability to ensure occupational exclusivity. It is essential to safeguard the integrity of degrees earned through accredited educational programs that are designed based on established qualification standards. Accreditation and quality assessment are the best mechanisms for ensuring the relevance and high standard of study programs in this field. Furthermore, these processes help foster confidence among employers. As some employers still hire individuals without the proper qualifications, the profession must develop mechanisms to regulate itself and separate qualified professionals from unqualified ones. Drawing a parallel to the medical profession, could hospitals hire individuals without the proper medical education?

The Role of Professional Certification - Similar to how a degree obtained through an accredited academic program serves as proof of advanced knowledge, an accredited professional certification (license) is recognized by the public as credible evidence of expertise and competencies within a profession (Adams, et. al., 2004). Certification programs typically establish benchmarks to assess an individual's competencies and professional skills. These benchmarks often include minimum education/training requirements, experience, and

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[15] This has been done in part by ASSE's Educational Standards Committee, which has identified specific outcomes for safety curriculum. These outcomes have been adopted by the Accreditation Board of Engineering and Technology (ABET) as part of the Applied Science Accreditation Commission (ASAC) for use in accreditation evaluations of safety programs.

proven knowledge and abilities demonstrated through exams.

Certification brings advantages at different levels. Individuals benefit from personal satisfaction, as they are recognized as qualified professionals by their peers and the wider community. Certification can also lead to incentives such as rewards, bonuses, increased responsibilities, career advancements, improved position, status, and higher salaries. Various salary surveys conducted by both ASSE and BCSP have shown that certified safety professionals receive significantly higher compensation than their non-certified counterparts (Brauer, 2008). For employers, certification can enhance a company's reputation and competitiveness (Adams, et al., 2004). Employers view certified candidates as possessing the necessary competencies, reinforcing the value and importance of hiring those with the proper certifications.[16] The creation of a certification exam is a time-consuming process. Currently, there is an increase in both the number of certifications in the OSH field and the number of certified individuals (BCSP, 2010c). Nevertheless, similar to the ongoing assessment of academic program quality, it is crucial to consistently evaluate and review the quality of certifications.

Evaluating Professional Certifications - Achieving high-quality certification is a costly and lengthy process. Therefore, it is crucial to evaluate the value and quality of certification. Generally, the more stringent the certification requirements, the greater the authority and recognition that certificate holders receive from the public, including external accrediting bodies, government agencies, employers, courts, and peers. Job advertisement analysis (Adams et al., 2004) indicates that employers often require certified professionals, such as those needed for expert testimony in court, among other roles.

CONCLUSION: MOVING OSH FROM OCCUPATION TO PROFESSION

Professions that are recognized and established possess several defining characteristics that set them apart from those still in the early stages of development. One of these key characteristics is the existence of a governing body responsible for overseeing the work and conduct

of professionals in the field. For the occupational safety engineer to complete their journey toward becoming a recognized profession, the following actions must be taken:

- First and foremost, the practice of employing individuals with insufficient qualifications for OSH positions (such as safety and health advisors or consultants) must be stopped.

- The field of OSH should primarily be made available to individuals with appropriate academic qualifications or relevant credentials, creating clear barriers for others and ensuring a distinction between qualified and unqualified professionals.

- It is necessary to initiate the development of a qualification standard for Occupational Safety Engineers, which would serve as the basis for accrediting academic programs in this area.

- Professional licensure or regulation can be a powerful tool in the process of establishing a recognized profession. Licensing, in accordance with established regulations and laws, provides strong support for professional practice. It effectively closes the profession to those who have not, or cannot, demonstrate the necessary education, training, or certification required for professional practice (The Knapp Report, 2003).

Evaluating these criteria clearly highlights that occupational safety and health is a profession that warrants regulation, recognition, and licensing. Achieving recognition as a profession is unlikely unless it changes the current hiring practices (employing individuals with inadequate qualifications), establishes barriers[17] to unqualified outsiders, and reaches a level of professional regulation, such as licensure. Furthermore, employers and professional associations in OSH must collaborate more closely with university programs to advance program-level accreditation. It is particularly important that employers prioritize Occupational Safety Engineers when hiring for occupational safety and health roles.

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[16] In many certifications, there is a need to provide a developmental path through paraprofessional certifications, so practitioners can progress toward a professional certification. Examples of paraprofessional (technician)-level certifications in OSH are construction health and safety technician (CHST), certified loss control specialist (CLCS) and occupational health and safety technologist (OHST). All of these certifications are offered by BCSP through the 28 professional safety (www.asse.org CCHEST). The OHST certification covers general safety and health practice at the technician level, CLCS covers loss control responsibilities common to the insurance industry, and CHST is designed for safety and health specialists in the construction industry (BCSP, 2010a).

[17] This may result in a short-term decrease in the number of "professionals for occupational safety and health," but in the long run, it affects the reputation and status of this profession.

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