

KNOWLEDGE MANAGEMENT IMPACT ON THE OCCUPATIONAL SAFETY AND HEALTH CULTURE IN ENTERPRISE

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Abstract:

Occupational Safety and Health (OHS) activity shows that all appropriate preventive measures taken, could support the better control (elimination or diminish) of the risks associated to the work processes. Through these preventive practices, in accordance with the legal requirements (properly applied), organizations avoid spending significant resources that could arise from work accidents and/or incidents. An important contribution to avoid accidents and the associated costs, which can even lead to bankruptcy, is related to the well-defined and implementation of the OHS culture. That culture exist tacitly, and is sometime ignored, until it is approached as a part of the organization knowledge management. In consequence, OHS culture is seen as a continuous value and not just a shifting priority depending on a particular situation or context. The most used and effective knowledge processes that contributes to the OSH culture development, is knowledge acquisition through the training programs address to organization's employees. In addition, the most important approach is to gain expected efficiency by applying other knowledge management processes as transfer and sharing. These will support the development of specific values (as intangible assets) that will nurture the OSH culture. In this context, the paper will present a methodological approach on how knowledge management processes will support the OHS culture development. Furthermore, there will be analysed the impact of applying the knowledge management processes for OSH training, in order to nurture the OSH culture, in the case of Romanian organizations.

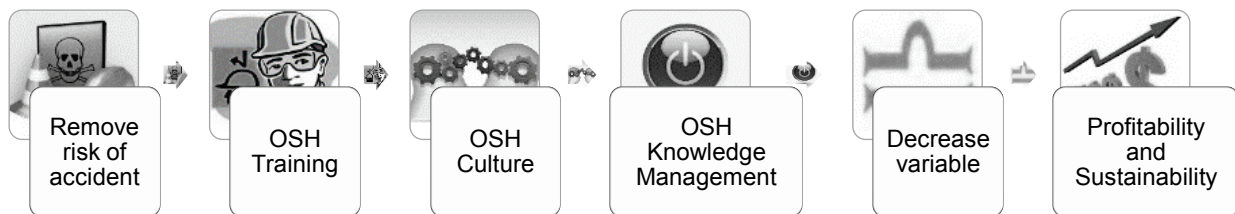
Keywords: Occupational Safety and Health (OHS), knowledge management, training, safety culture

1. INTRODUCTION

As there have been anticipated by (Drucker & Drucker, 1994), the new economy is based on knowledge, and this contribute to the ensuring of the sustainability of resources and the development of enterprises, in order to become more competitive. In this context, an important resource that brings added value to the knowledge management approaches is the intellectual capital (composes by human, structural and relational capitals). The intellectual capital development is strong related to education investment, train the trainers (or educators, teachers trainings) and lifelong learning programs implementation.

At the organizational level, competitiveness is gained through the high level of human resources competencies and expertise valorisation. Thus, training programs implementations and organizational development strategies are important ways for employees' competencies up-date and development. The article will debate the way in which knowledge management processes could support the OHS culture development. Picture 1 shows the important concepts that interfere with the proposed approach.

Picture 1: Interdependence flow between work accidents (due to variable expenses) and the effect on profit disrupting.



Any undertaking aimed at obtaining profit and activity resources (in a sustainable manner) will be affected by the way business process are monitoring and controlled. But operating in an uncertain and turbulent environment, organizations are forced to control and monitor a large amount of data and information that are variable and in continue dynamics, evolution. Thus, the need of knowledge management is tremendous in order to have a positive impact on risk management, including the OHS risks (see Picture 1). This has to be the core activity of modern management and this will assure a healthy organizational culture development, too. Continuous training in the field of OSH has to underline the usefulness and implication of the knowledge processes in order to eliminate, mitigate, and control risks together with their effects.

2. A DEBATE ON SAFETY CULTURE

The term "safety culture" has be introduce for the explanation of the Chernobyl nuclear disaster in 1986. The cause of this disaster was attributed to a breakdown in the organization's safety culture as the report of the International Atomic Energy Agency shown. Since then poor safety culture has been implicated in many other reports of official inquiries into major disasters.

A synthesis of the most relevant definitions of safety culture is shown in Table 1. Most of them are global and highly implicit. The literature review have shown that researchers and practitioners opinions are more related to the concept of safety climate because employees' attitudes are considered to be a very important dimension of the organizational culture (Guldenmund, 2000). Most of the relevant references on safety culture (and climate as suggested by (Guldenmund, 2000))

- The concept is not yet well-defined and described. In addition, The relationship between safety culture and safety climate is unclear;
- There is considerable confusion about the cause, the content and the consequence of safety culture and climate;
- There do not exist a well-accepted and generalized model of safety culture nor safety climate;
- The issue of the level of aggregation has not received the attention it warrants.

From the perspective of the dimensions that are defined in order to characterize the safety culture, there have been observed that they are strong related to the authors' research objective that was to

develop a method for safety improvement for a particular type of an organization (or economic activity or occupation). The literature review has discovered that the most cited works in the field were developed for practical reasons (Table 1).

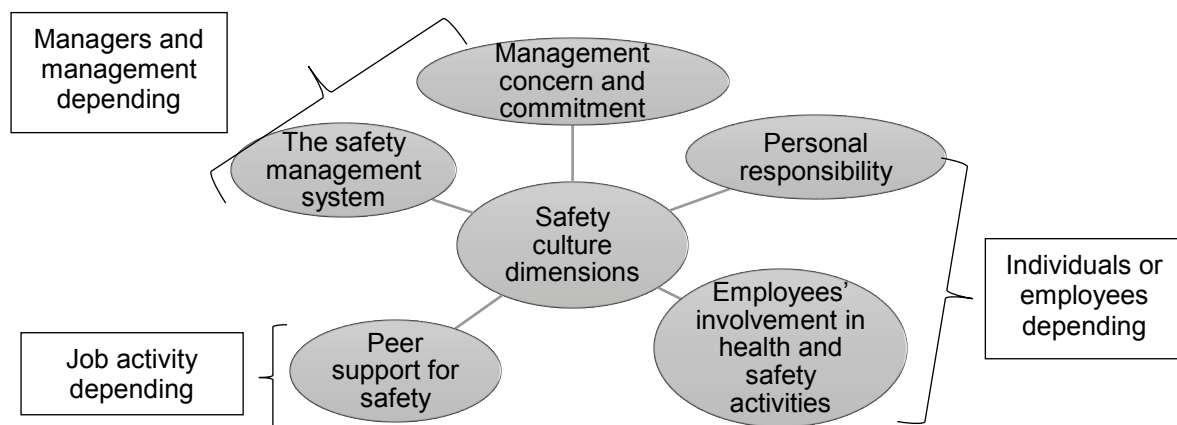
Table 1: A synthesis of the definitions and dimensions of safety culture

Reference	Definition	Dimensions
Cox and Cox (1991)	Safety cultures reflect the attitudes, beliefs, perceptions, and values that employees share in relation to safety.	<ul style="list-style-type: none"> - Personal scepticism; - Individual responsibility; - Safeness of work environment; - Effectiveness of arrangements for safety; - Personal immunity;
International Safety Advisory Group (1991)	Safety culture is that assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance.	
Pidgeon (1991)	The set of beliefs, norms, attitudes, roles, and social and technical practices that are concerned with minimizing the exposure of employees, managers, customers and members of the public to conditions considered dangerous or injurious.	
Ostrom et al. (1993)	The concept that the organization's beliefs and attitudes, manifested in actions, policies, and procedures, affect its safety performance	Safety awareness; Teamwork; Pride and commitment; Excellence; Honesty; Communications; Leadership and supervision; Innovation; Training; Customer relations; Procedure compliance; Safety effectiveness; Facilities;
Geller (1994)	In a total safety culture (TSC), everyone feels responsible for safety and pursues it on a daily basis	<ul style="list-style-type: none"> - Person (knowledge, skills, abilities, intelligence, motives, personality) - Behaviour (complying, coaching, recognizing, communicating, demonstrating actively caring) - Environment (equipment, tools, machines, Safety procedures (confidence in the safety procedures) - Safety rules (personal understanding of safety rules; perceived clarity of safety rules; - Permit to work system (confidence in effectiveness, general support, perceived need) - Risks (personal caution over risks; perceived level of risk at work; perceived control of risks in the plant; personal interest in job) - Job satisfaction (contentment with job; satisfaction with work relationships; satisfaction with rewards for good work) - Participation/ownership (self-participation in safety procedures; perceived source of safety suggestions; perceived source of safety actions; perceived personal control over safety) - Design (satisfaction with design of plant) - Training (satisfaction with training selection; satisfaction with staff suitability)housekeeping, heat/cold, engineering)
Berends (1996)	The collective mental programming towards safety of a group of organization members	<ul style="list-style-type: none"> - Confidence in the arrangements for safety - Compliance with safe working practices - Perceived priority given to safety - Own active effort put in safety matters - Communication about safety
Lee (1996)	The safety culture of an organization is the product of individual and group values, attitudes, perceptions, competencies, and patterns of behaviour that determine the commitment to, and the style and proficiency of, and organization's health and safety management.	

Source: adapted from (Guldenmund, 2000)

Despite the conclusions of the literature review, the organizational practice in the field of OHS requires researches, but they need most innovative solutions to the occurred problems. An organization is regulated by government but it should go beyond just complying with externally imposed criteria. Simultaneously, the organization should concentrate on the nurture and sustain of its culture. There must be an emphasis on the need for every employee to “own” and take responsibility of his/her actions for safety improvement, rather than seeing this as an imposed act, action from outside (Kelly, 2009). Recent studies have confirmed that occupational safety as part of enterprise’s business strategy helps to decrease accidents, illnesses, reduce absenteeism, turnover rates and increase profits and productivity, and create jobs (Roa & Merisalu, 2010; Jarvis et al., 2014). In addition, in literature there are presented models of safety culture (Jarvis & Tint, 2009). The common aspects and dimensions considered in order to characterize safety culture (details included in Table 1) are: management concern and commitment, personal responsibility, peer support for safety, employees’ involvement in health and safety activities, and the safety management system (Picture 2).

Picture 2: Safety culture dimensions as a result of the literature review.



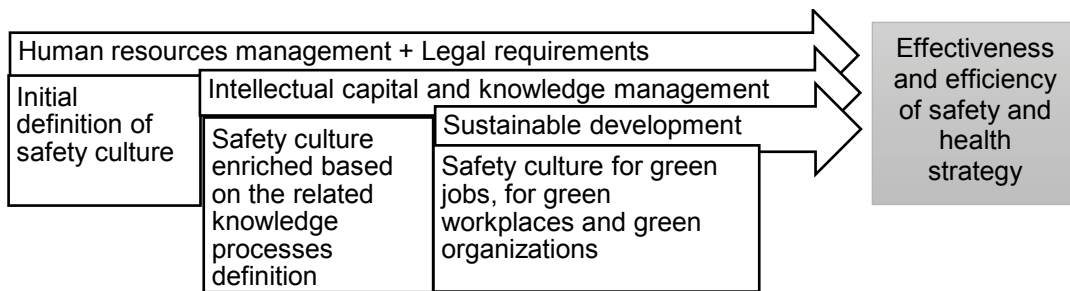
Source: authors own development

Based on the presented synthesis of Table 1 and Picture2, in the following there will be debated the problem of knowledge management processes influence and impact on the safety culture.

3. KNOWLEDGE MANAGEMENT IMPACT ON SAFETY CULTURE DEVELOPMENT

Different researches have recognized that the safety culture was born in the area of human resources management and it has been enriched by the influence of intellectual capital and knowledge management theories (Roslender et al., 2006; Nuñez & Villanueva, 2011; Jarvis et al., 2014). From the practical perspective, the effectiveness of safety culture is strongly dependent on the legal procedures and processes. The legal requirements implementation depends on organization’s intellectual capital. Actual researches have recognized the contribution of safety culture on workplace well-being (sustainable workplaces), green jobs development and organizations’ sustainable development (Montero et al., 2009; Penzenstadler et al., 2014; Valenti et al., 2015). A synthesis of this brief overview is shown in Picture 3.

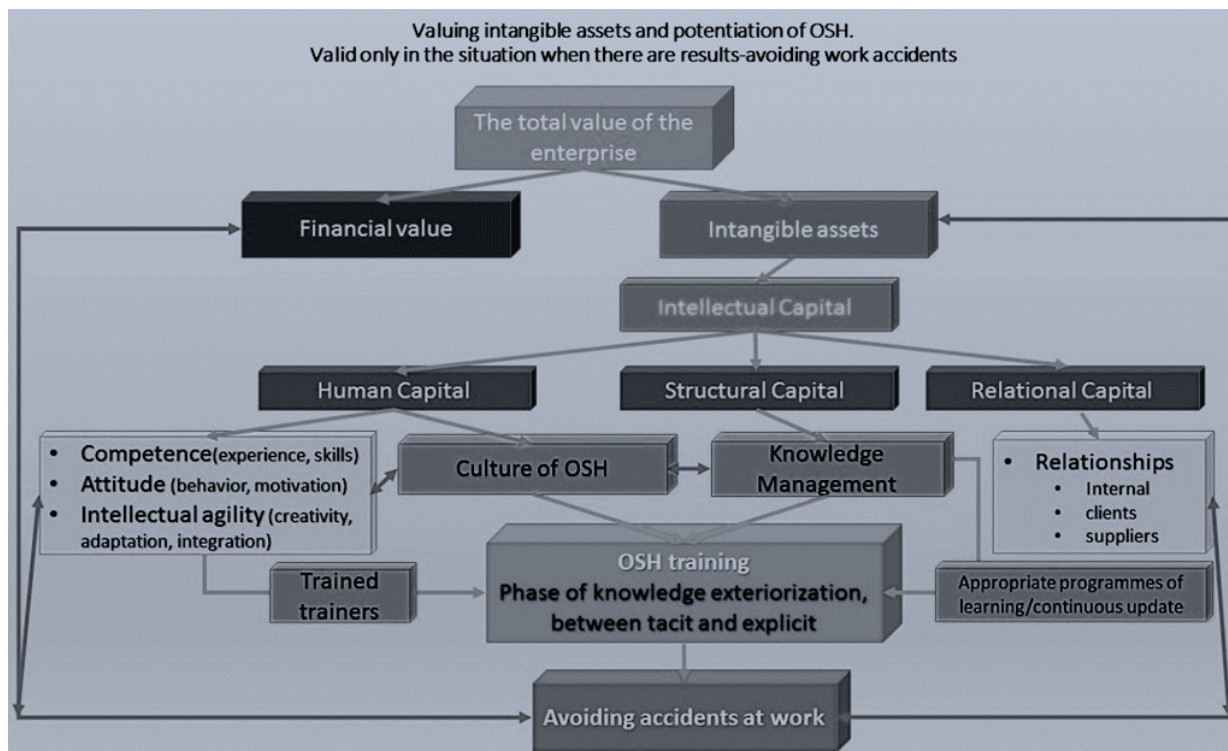
Picture 3: Safety culture evolution as a result of the literature review.



Source: authors own development

The analysis of the total value of an enterprise, by considering the relevant details of the intellectual capital structure has shown the positions and relations of the safety culture (or as mention in Picture 4, the Culture of OHS) and knowledge management in order to attend the general objective of risk mitigation.

Picture 4: Knowledge management and safety culture position and relations within intellectual capital



Source: authors own development

Based on the available perspectives of knowledge (presented in Picture 3) and the relations described in Picture 4 there have been created an inventory of the dimensions that characterized the safety culture.

Table 2: An inventory of the safety culture dimensions based on knowledge management influence

Managers, management and organization	Individuals or employees	Job activity
<ul style="list-style-type: none"> - Organizational values; - Leadership and management commitment and support - OHS management system and documentation; 	<ul style="list-style-type: none"> - Commitment - Perceptual and cognitive skills - Safety knowledge and 	<ul style="list-style-type: none"> - Time and contracts for knowledge sharing - Team working (interdependencies) - Goal commitment

<ul style="list-style-type: none"> - OHS strategy and policy (planning and implementation) - <i>Knowledge based safety leadership</i> - Conflict and change management - Risk management and mitigation - Competence and training programs for managers - Communication, feed-back and co-operation; - <i>Knowledge dissemination and transfer into practice</i> - <i>Knowledge sharing</i> - Performance monitoring and measurements 	<ul style="list-style-type: none"> <i>training competence</i> - OHS expertise - <i>Personality and willingness to share knowledge, to learn</i> - Values - Compliance - Relationships - Satisfaction 	<ul style="list-style-type: none"> - Personal responsibility, co-worker peer support - Involvement in decision making processes - Safety guidelines - <i>Accidents record, database and availability</i> - Communication tools - <i>Tools and knowledge sharing mechanism</i> - <i>Embedding knowledge management in the work process</i>
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Source: authors own development

As presented in Table 2, safety culture is related to two main parts: organization and its management on one side, and the employees and their job activities on the other side. From this perspective, there have been underlined that organizations have to be more careful on how their safety knowledge is managed with the support of related processes: how knowledge is created, transferred, exchanged or share and used or exploited by their employees (including managers from different levels). This will positively affect safety culture and simultaneously, will change employees' safety behavior into a desirable one. The suggested knowledge management processes in the inventory can also be decomposed into sub-processes and activities for all the inter-relations within an organization. The presented inventory of the safety culture dimensions provides a comprehensive framework about processes and aspects that could be developed later in association with a diagnosis tool.

4. OSH TRAINING PROGRAMS FOR SAFETY KNOWLEDGE DEVELOPMENT

The most important aspect that has been investigated was the impact of the training programs on building an effective safety culture. This was related to the knowledgeable dimension that could support safety culture development. From the knowledge processes point of view, this dimension is related to the knowledge acquisition, transfer and sharing. The investigation took part in Romania where the OSH training programs are executed in three phases (Table 3). For each training phase, there were associated percent's for each considered knowledge processes. Calculations were done after each OSH training session (of all types/phases), for more than 50 organizations, in the last two years (Table 3).

Table 3: OSH training programs phases in Romania

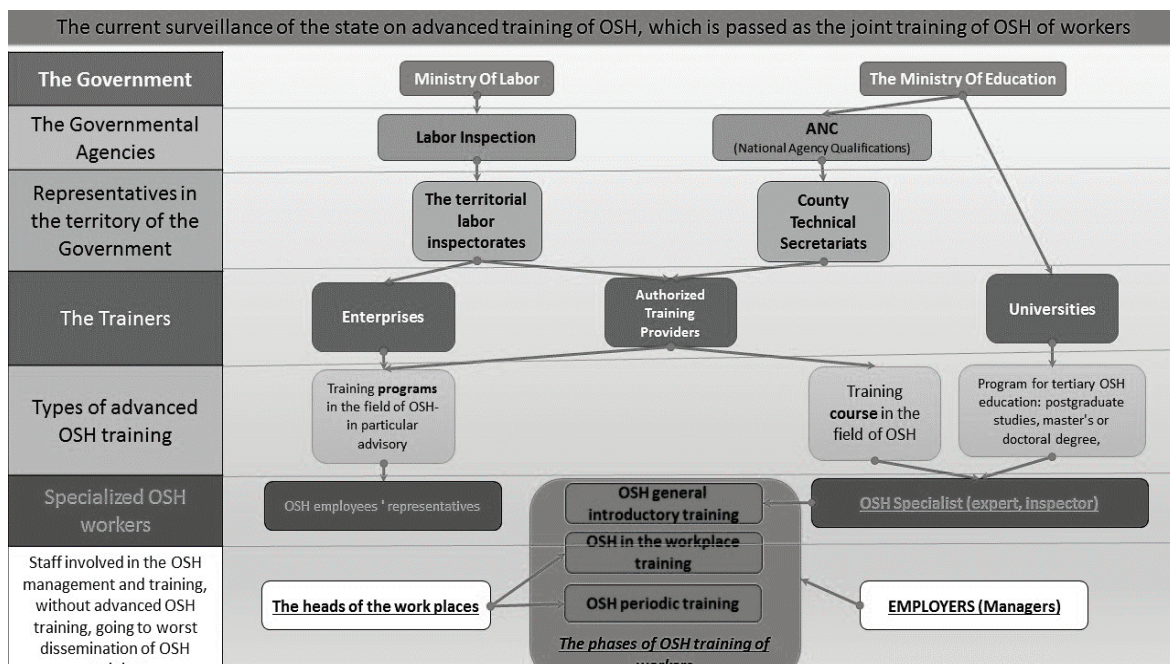
Training type/phase	Trainers	Responsible	Knowledge processes (%)
1. <i>General overview. Introduction in OHS</i> (general treats, risks and their legal and normative perception, legislative issue, motivational aspects of the intervention for the risks mitigation)	Authorized trainers providers (specialists, inspectors) in OSH filed	Employer (top management)	Knowledge acquisition 45% Knowledge transfer 45% Knowledge sharing 10%
2. <i>Training program in the context of the workplace specificity</i> (specific integrative risk management issues)		Employer (top management)	Knowledge acquisition 50% Knowledge transfer 25% Knowledge sharing 25%
3. <i>Periodical training programs</i> (up-date and refresh of the knowledge presented in previous training programs; prevention of the emerging risks)	The leader of the workplace (middle management)	Employer (top management)	Knowledge acquisition 30% Knowledge transfer 30% Knowledge sharing 40%
4. <i>Additional periodical training programs</i> (add new			Knowledge acquisition 20% Knowledge transfer 20%

knowledge and refresh the existing one)		Knowledge sharing 60%
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Source: authors own development

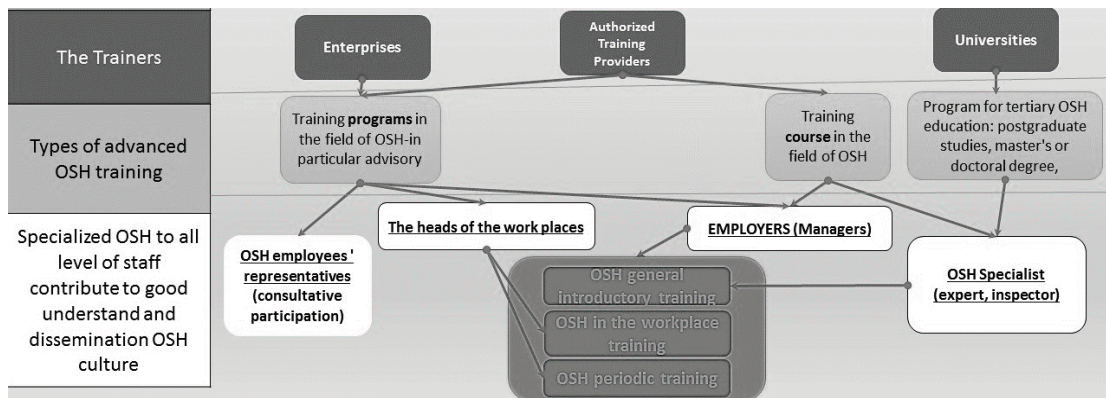
The particularities of the OHS training program in Romania, in the case of OSH specialists, is described in Picture 5. Within the different layers (considered together with the diffusion of the national regulations and laws to the practical level, in organizations), there have been represented the responsible factors for the specific laws and regulation implementation, and the ways of how trainings program in the field act. The last two layers represent the tactical level of the implementation that is supported by OHS employees' representatives, the OHS specialists (experts and inspectors, usually outside the organization) and, finally, the low managers and the staff involved in the OHS management (including trainings and development). The last two layers were detailed then in accordance with the practical experience and observations during the last two year of trainings done with different organizations (Picture 6). In accordance with the details given in Picture 6, there have been added important actors (that have important roles in supporting the knowledge processes) of the last layer: employee's representative with consultative participative role, low managers that are heads of the workplaces and that have the role of knowledge exploitation (and also, in delivering important information on training needs), the employees including those that are managers and OHS specialists (experts, inspectors) that have the role of specialized trainers and consultants.

Picture 5: The legal compliance for the OSH specialists training



Source: authors own development

Picture 6: Legal compliance for OSH specialists and additional good practices associated to the training process (middle and top management involved in training and associated knowledge management processes)



Source: authors own development

5. CONCLUSIONS

This article presents some preliminary research concerns with the organizational safety culture, so call the OHS culture. For the purpose of the study there were have been analysed relevant references in the field, in order to develop a synthesis of the definitions and dimensions of safety culture (Table 1). The analysis of previous researches have underlined the importance of employees' attitudes to safety as part of that culture, as well as the ability to learn, which should also mean changes in employees' behaviour in order to enhance safety culture.

Despite the growing interest in knowledge management studies, only a few researches have been conducted in the field of OHS. Based on this fact, we have been strongly motivated to associate the OHS approach with knowledge management perspective. This has allowed the development of a framework of the safety culture dimensions (Picture 2) that have been analysed (theoretical and through many practical cases) from the perspective of the potential support given through the knowledge management processes. In addition, there have been identified the knowledge management and safety culture position and relations within intellectual capital structure (Picture 4). The premise of our developments is that safety, as a form of organizational expertise, could be situated in the system of on-going practices that has both explicit and tacit dimensions. This support the building of an inventory of the safety culture dimensions based on knowledge management influence upon them. In addition to the presented information, safety knowledge can be conceptualized as an employees' understanding of the safety procedures within an organization.

Through the case study of the OHS training programs in Romania, there have been demonstrated that knowledge processes has become an important and intensive way for increasing the effectiveness of the learning process (mainly through knowledge acquisition, transfer and sharing). From the organizations' point of view, one of the key ways to continue increase the efficiency of safety knowledge exchange and exploitation is to develop an appropriate organizational structure as well as new and more flexible ways of OHS training programs.

Future researches will be focus on the development and implementation of a survey in order to find out the state of safety culture definition in the case of Romanian organizations. This research will be based on the developed framework of the safety culture (Picture 2).

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