Instilling Safety Culture into Future Occupational Health and Safety Specialists

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Abstract. This paper analyzes the environment of instilling a safety culture into future occupational health and safety specialists. What makes this research relevant is that it proposes, substantiates, and seeks to create a productive environment to teach competitive occupational health and safety specialists. Higher education should produce a personality that is stably capable of safe occupational behavior and of protecting others from a variety of occupational risks. This paper analyzes Russian and international publications on instilling safety skills; it also presents a survey of occupational health and safety students, specialists, and professors. Research results prove it relevant. The finding is that proper environment for instilling a safety culture into future occupational health and safety specialists results in better training.

1. Introduction

Vocational education today seeks to train competitively-skilled specialists that are occupationally mobile and instilled with a safety culture. High training quality requires a teaching process that meets certain teaching requirements.

Psychological and educational research has shown that universities that train occupational health and safety specialists tend to ignore the factors that shape the culture of safety from anthropogenic risks, which cannot be prevented if the specialist has to rely on their practical experience alone.

Below are the primary reasons why future occupational health and safety specialists generally tend to lack a safety culture:

– weak safety culture is due to high injury and occupational disease occurrence rates;
– weak safety and occupational safety culture results in undisciplined labor, frequent breach of in-house labor regulations, and violating the legislative regulatory requirements on occupational safety;
– healthy lifestyle culture is lackluster, which jeopardizes the health and life of workers at work.

Thus, instilling a safety culture into future occupational health and safety specialists is an urgent social problem that must be seen through the lens of the learning environment that seeks to amplify students’ creativity in resolving occupational issues and situations.

2. Research methods and methodology

The methodology of this research is based on the theory of personality (development, education, and training); cultural, systemic, and interactive approaches to the process of instilling a safety culture; the conceptual foundations of teaching occupational health and safety specialists.
The research uses comparative analysis of literature and also analyzes the legislative and regulatory documents; empirically, the research team has surveyed occupational health and safety students and specialists to evaluate, and collect self-evaluations of, their work. Empirical studies have identified the best environment for instilling a safety culture into future occupational health and safety specialists.

The novelty hereof is that the paper identifies the contradictions (and causes thereof) between the opportunities the occupational health and safety specialist training system provides and the lackluster learning environment that fails to effectively instill values and value guidelines into students.

Research materials might be useful for universities training occupational health and safety specialists to help them develop professionally; it might also find use in advanced training of such specialists at factories and other businesses.

Analysis of the teaching theory and practice output in the context of the authors’ own experience of instilling a safety culture into future occupational health and safety specialists indicates a number of contradictions between:

– the society’s need for properly trained occupational health and safety specialists and the actual state-of-the-art of the safety culture such specialists are instilled with;
– the need for safekeeping workers’ lives and health in an emergency and the learning environment that fails to instill a safety culture into future occupational health and safety specialists;
– outdated approaches to organizing the teaching process at universities and other higher education providers that train occupational health and safety specialists—and the need to apply teaching and production innovations that can bolster creativity.

3. State of the art

Many publications analyze safety culture issues in the light of life safety. In the Russian Federation, there has been defended about 30 dissertations on instilling a safety culture into preschool children, schoolchildren, students, and health and wellness teachers (V.V. Gafner, V.N. Kuznetsov, V.A. Mashin, S.N. Sokolova, T.V. Suvorova), with some papers using such terms as ‘life safety culture’ (V.A. Akimov, T.V. Belykh, Yu.L. Vorobyov, I.A. Golubeva, A.A. Dronov, R.A. Durnev, V.A. Yevtseyev, T.V. Zyryanova, T. Ivanova, A.V. Kazmina, P.I. Kaygorodov, S.E. Kosynkina, A.A. Mikhailov, T. Melnikova, L.A. Mossoulina, I.N. Nemkova, I.V. Petrukhina, Yu.V. Repin, A.I. Sadretdinova, A.V. Snegiyrov, N.V. Tverdokhlebov), ‘personal safety culture’ (M.V. Golovko), ‘occupational safety culture’ (N.A. Usachev), L.N. Gorina, I.V. Iovenko, and V.N. Moshkina made great contributions to teaching with their doctoral theses.

One of the foci of this research was made on finding publications on the psychological and educational environment that could instill a proper (life) safety culture and environmental culture, see Table 1.

| #   | Author               | Title                                                                 | Proposals on the learning environment |
|-----|----------------------|----------------------------------------------------------------------|---------------------------------------|
| 1   | M.V. Golovko, [1, pp. 90-92] | Learning Environment that Integrates Competency- and Situational Approaches to Instill a Personal Safety Culture | Externally: – co-creative actor-to-actor teacher-student interaction; – need for an air of creativity, a creative teacher who ‘irradiates’ their creative strength; – students must become independent creators; – arranging a success; – special infrastructures for the learning process; – special staffing. Internally: – teaching to treat future job as an emotional value; – actualizing and reinforcing the need for creativity; |
|   | Author            | Title                                                                 | Points                                                                                                                                   |
|---|-------------------|----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| 2 | V.N. Moshkin      | Instilling a Safety Culture Into Schoolchildren                        | – inner freedom.                                                                                                                         |
|   | [2]               |                                                                      | – learning process infrastructures;                                                                                                     |
|   |                   |                                                                      | – learning process methodology;                                                                                                        |
|   |                   |                                                                      | – teachers’ safety culture level;                                                                                                        |
|   |                   |                                                                      | – schoolchildren’s safety culture level;                                                                                                 |
| 3 | A.A. Dronov       | Instilling a Life Safety Culture into Vocational School Students      | – learning process tailored by the teacher to world-view ideas, moral values, and personal motivation of the students;                     |
|   | [3]               |                                                                      | – integration of knowledge and skills into a single interconnected life safety complex based on a You Know It, You Do It rule;             |
|   |                   |                                                                      | – promoting healthy lifestyle up the scale of individual values, as it is a crucial factor of family life, career, and active longevity;   |
|   |                   |                                                                      | – teaching the methods of spiritual and physical self-enhancement;                                                                     |
|   |                   |                                                                      | – instilling mutual respect and tolerance as the fundamental requirement for safety;                                                    |
|   |                   |                                                                      | - the teacher should seek to raise the level of civic engagement, as it is crucial for the national security;                           |
|   |                   |                                                                      | – the teacher should master the learning model designed to instill a life safety culture into students;                               |
|   |                   |                                                                      | – teaching the methods of spiritual and physical self-enhancement;                                                                     |
|   |                   |                                                                      | – instilling mutual respect and tolerance as the fundamental requirement for safety;                                                    |
|   |                   |                                                                      | - the teacher should seek to raise the level of civic engagement, as it is crucial for the national security;                           |
|   |                   |                                                                      | – the teacher should master the learning model designed to instill a life safety culture into students;                               |
|   |                   |                                                                      | – teaching the methods of spiritual and physical self-enhancement;                                                                     |
|   |                   |                                                                      | – instilling mutual respect and tolerance as the fundamental requirement for safety;                                                    |
| 4 | A.V. Snegiryov    | Psychological and Learning Environment to Instill Life Safety Culture | – instilling a life safety culture must be a process that has a personal meaning for students;                                         |
|   | [4]               |                                                                      | – applying innovation to the learning process;                                                                                           |
|   |                   |                                                                      | – implementing individualized and personality-oriented learning;                                                                     |
|   |                   |                                                                      | – integrating the learning processes of universities and other institutions or organization, whether related to education or not;      |
|   |                   |                                                                      | – introducing special disciplines to instill a life safety culture as part of the learning process.                                     |
| 5 | A.I. Sadretdinova | Designing a Learning Environment to Instill a Life Safety Culture     | – creating a healthy environment;                                                                                                        |
|   | [5, pp. 410-411]  | Into Older Preschoolers                                             | – using a teaching technology as a fundamental factor of nature-appropriate and health-saving learning process;                       |
|   |                   |                                                                      | – a diagnostic toolkit to identify the level of life safety culture older preschoolers have.                                          |
| 6 | A.V. Klyuev, M.A. | Instilling a Safety Culture in the Context of Today’s Risks          | – natural and continuous interaction of the basic components of a social and learning environment to set up and proceed with a learning process to instill a culture of safe behavior when exposed to any kind of threat; |
|   | Shatov, A.P. Savin|                                                                      | – appropriate and state-of-the-art infrastructures;                                                                                     |
|   | [6, p. 134]       |                                                                      | – high-quality training of professional teachers hired to teach students how to behave safely when exposed to the today’s risks;        |
|   |                   |                                                                      | – developing innovative methods to amplify the}
emotional processing of teaching action.,

7  I.V. Abdrashitova [7, pp. 118-122]  Learning Environment to Efficiently Instill Students with Environmental Culture – instilling the morals and esthetics of environmental culture into university students; – the learning process must be focused on the environment and its pertaining moral and esthetic values; – the moral and esthetic aspects must become crucial to students’ research and creativity; – professional and educational reflections of future teachers on how to apply morality and esthetics to raise environmental awareness; – instilling a culture of conscious choice of eco-friendly behavior guided by moral and esthetic values; – creating a learning environment and a model to instill the morals and esthetics of environmental culture into students.

8  N.N. Maslennikova [8, pp. 139-143]  Learning Environment to Instill Environmental Awareness Into University of Technology Students – humanizing the process of environmental education, making an emphasis on education, self-development, and self-actualization of a student as a personality; – teaching focused on student’s personality, the subject-oriented approach replaced with a personality-oriented one; – the teacher must seek creativity and be creative in teaching; – students and teachers must join their productive efforts and engage in actor-to-actor relations; – reasonably selected forms and methods of providing environmental training.

9  I.V. Petrukhina [9, p. 154]  Learning Environment for Training Environmentally Aware Physical Education and Life Safety Teachers – future teachers must be positively motivated to engage in environmental activism; – interdisciplinary integration of environmental modules within the general, scientific, special, and additional training courses future teachers complete; – engaging the future teachers in environmental activism.

This overview makes clear the diversity of approaches to learning environment. At the same time, special focus should be made on defining and substantiating a learning environment designed to instill a safety culture into future occupational health and safety specialists. This theoretical overview has been used to compile an expert survey to identify what kind of environment students need to be instilled with an occupational safety culture. Survey respondents were asked to rank the 10 factors on the list as follows: rate the most important factor of instilling a safety culture into future occupational health and safety specialists as #1, the least important one as #10. Expert opinion was provided by top occupational health and safety specialists based in the Republic of Crimea and selected on the basis of
their qualifications, experience, knowledge of occupational health and safety, the intervals of re-learning the legislative and regulatory documents on the matter, and participation in topic-specific conferences and workshops. Below are the results of the expert survey designed to identify what kind of environment students need to be instilled with an occupational safety culture.

4. Research results

Instilling a safety culture into future occupational health and safety specialists must be a systematic and consistent effort enabled by an optimized learning environment, one important aspect of which is the set of teaching conditions.

S.I. Ozhegov’s dictionary defines a ‘condition’ as a “circumstance, upon which something depends; a requirement to one of the parties in contract; a vernal or written agreement on something or an the circumstances of doing something.” [10, p. 62]

Conditions are believed to define how a subject relates to the processes and phenomena around it, without which it cannot exist [11, p. 170].

Yu.V. Podpovetnaya defines conditions as circumstances including the objects targeted by any action, the objective features of developing an active personality, the tools, means, and forms of arranging a specific process [12].

This research pertains to pedagogy, which necessitates defining the concept of ‘teaching conditions’. V.A. Slastenin defines ‘teaching conditions’ as the actions taken to improve teaching performance [13].

The team behind this research believes that instilling a safety culture into future occupational health and safety specialists requires such teaching conditions—or the learning environment—that are tailored to professional specifics of the major and adjusted to the circumstances that might affect such instilling process in general.

Literature overview, the professional specifics, the expert opinion, as well as the practical experience of teaching at a university have enabled the authors to define and describe a learning environment that could help instill an appropriate safety culture into future occupational health and safety specialists, positively motivate them to be instilled with such culture, integrate the curricular contents that contribute to a holistic safety culture system on an interdisciplinary level, use innovative forms and methods of teaching, and boost future specialists’ creativity in handling abnormal situations.

Let us consider the learning environment proposed. According to the expert survey, the first condition of instilling a safety culture into future occupational health and safety specialists (least total #) was the positive motivation to be instilled with a safety culture.

Judging from the results published by B.G. Ananyev, A.N. Leontyev, A. Maslow, and P.M. Jacobson et al., it is safe to assume that motivation is a fundamental problem of personality psychology.

Psychologists define motivation as a trait and quality of personality that comprises all kinds of stimuli: motives, needs, interests, goals, and motivational stimuli.

To develop a positive attitude towards safety culture, future occupational health and safety specialists need the following motives: a social motive to meet the needs of professional training for future specialists; an achievement motive that lies in the desire to become highly professional and intelligent; the need to apply the acquired knowledge at job; and a motive to seek better knowledge and skills, and higher professional levels.

As the motivational environment is non-stationary, positive motivation can arise at the university or as part of personal self-enhancement and self-development. Thus, if this condition is met, it indicates that future occupational health and safety specialists have their demands in higher-level labor, occupational health and safety culture satisfied.

Notably, experts also highlighted the interdisciplinary integration of curricular contents, which is intended to create a holistic system of safety culture knowledge, as a necessary condition. This condition implies acquiring sufficient and profound knowledge of occupational health and safety as
well as that of environmental safety, in addition to the ability to appropriately respond to a variety of emergencies. The scientific knowledge presented as part of the occupational safety curriculum is provided by an integrative system that is based on the Russian Constitution and comprises occupational health and safety laws as well as environmental regulations.

An philosophical encyclopedic dictionary defines the category of ‘contents’ as the corresponding aspect of a whole, its specifics, internal processes, and connections between contradictions and tendencies [14, p. 63]. Integration is defined as a merger of elements that advances and strengthens their interconnection [15, p. 51]. Practical experience shows that interdisciplinary learning process helps identify and discover the interconnected facts and phenomena studied by various disciplines [15, p. 109].

Notably, integrating the meaningful contents of a safety culture must follow a logic of identifying the peculiar features of the modern scientific background of occupational health and safety while also integrating cutting-edge scientific knowledge and occupational challenges. Integration is enabled by a systemic approach. The concept of integration implies there are (previously) separate elements, connections, relations; it also involves structuring the holistic content of knowledge.

Therefore, the integrity of scientific knowledge is closely related to the ideas of integration, as integration seeks to create a holistic system, in this case applicably to occupational health and safety. Based on the above, the structure of a safety culture is analyzed herein through the lens of such disciplines as life safety, health 101, workplace ergonomics, psychology of occupational safety, safety in the technosphere, technosphere safety management, occupational safety management. At the same time, given how multifaceted technical knowledge is, we believe that structuring the meaning of a safety culture must use a modular approach that interconnects the elements of integrated knowledge from various disciplines while also linking them to the practice to teach students the necessary practical skills.

According to the experts, the next teaching condition implies that how effectively a safety culture in instilled into future occupational health and safety specialists depends on whether the university curriculum makes use of innovative learning technologies. This research makes emphasis on ICT.

Teaching technology is a system that brings together all the components of the scientifically backed learning process, which must be sufficiently algorithmized and target-focused. Scientists enumerate the following key objectives ICT helps accomplish: greater creativity thanks to less reproduction effort; a boost to constructive and algorithmic thinking by the virtue of how computers are used; furtherance of research skills by using simulation software; using ICT to prepare students to self-learning; deeper interdisciplinary linking thanks to using state-of-the-art data processing tools when solving problems from different subjects; more efficient and generally better training that employs ICT in the learning process [16].

To instill a safety culture into future occupational health and safety specialists, the learning process uses visualizations, multimedia and video, websites, and web quests, which helps address the multifaceted challenges of teaching. Gaming, project-based learning, and case studies boost cognition. Therefore, this teaching condition enables more efficient training thanks to more ample opportunities to instill communication skills and to using individual differentiated approach to simulating a variety of occupational situations.

Releasing creativity in handling emergencies is another teaching condition the experts have ranked 4th.

Creativity is the subject matter of a variety of sciences. Philosophically, an act of creation is a cognitive and practice act that produces new values, connections, and patterns. Psychologically, it is an act of creating something new that was previously unknown to the creator [17].

Scientists believe pedagogical creativity is always organically connected to research, scientific analysis, and implementation of best practices [18].

A teacher will always surface as a creative individual when he or she creates. According to Ye.N. Otic, individual creativity is a dynamic phenomenon, a complex open system, a person’s life program. For her, a creative teacher is one that seeks innovation and searches for more efficient teaching
methods; his search is one that will satisfy the needs, but whatever has been achieved is not satisfactory; he is risk-taking, which motivates him to search more extensively provided that he has projected the uncertainty and danger zones in advance [19, p. 177].

According to S.A. Sysoeva, a comfortable creative atmosphere and a favorable psychological climate in the team coupled with a democratic teaching style are crucial to creativity and individual self-actualization [20, pp. 221-222].

We believe that the safety culture will see a more creative development if students are tasked to handle various abnormal situations, which will induce analysis and reflection (occupational safety case analysis, analysis of types and meaning of future jobs, reflections upon the difficulties in learning, analysis of professional experience), construction and projections (modeling the work of an occupational health and safety specialist, modeling non-standard situations with a professional focus), organizational and managerial thinking (development and implementation of an occupational health and safety management system tailored to a specific enterprise, planning occupational injury preventions), and corrective actions (amending the occupational health and safety training plans in compliance with regulations, regulating the actor-to-actor relations, on-the-go analysis and use of regulatory information pertaining to the occupational health and safety management system).

5. Conclusions
Thus, all of the above leads to a conclusion that whether a safety culture could be instilled successfully will depend on how successfully the teacher/school is at creating (i) a learning environment that will positively motivate students to reach for their goals, (ii) a holistic system of professional knowledge, (iii) use of innovation to boost the creativity of future occupational health and safety specialists. Further research will produce a theoretical model of how such culture in instilled.

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