EXPLORING THE QUALITATIVE DIMENSIONS OF INDIVIDUAL MOTIVATION OF EMPLOYEES IN SELECTED MACEDONIAN MANUFACTURING COMPANIES FOR OCCUPATIONAL HEALTH AND SAFETY TRAININGS: A SELF-DETERMINATION THEORY PERSPECTIVE

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Abstract: *Individual motivation plays a fundamental role in shaping human behavior, and this holds true for employees within the realm of occupational health and safety (OHS). Consequently, comprehending employee motivation from various levels and perspectives within organizations assumes paramount importance.*

Among the crucial components of Occupational Health and Safety Management Systems (OHSMS) within organizations, as well as OHS more broadly, are the OHS trainings provided to employees. This research aims to characterize the qualitative dimension of employee motivation, drawing upon the framework of the Self-Determination Theory (SDT), in manufacturing organizations located in the Republic of Macedonia. The findings of this study aim to contribute to a deeper understanding of employee motivation and aid in the enhancement of organizational approaches to the design of OHS trainings.

The identification of qualitative dimensions of employee motivation, as per the principles of SDT, is grounded in the analysis of existing scientific and research literature, supplemented by a survey conducted among a sample of 70 employees.

Key words: employee OHS trainings, motivation, Self-Determination Theory, qualitative dimensions of motivation, manufactory industry, work accidents

1. INTRODUCTION

Employee occupational health and safety trainings (e-OHS-t) are crucial for creating a safe and healthy work environment. These trainings provide employees with the knowledge, skills, and awareness necessary to prevent work accidents and promote a safety-conscious culture within organizations. Research has shown that well-designed and comprehensive e-OHS-t programs lead to improved safety outcomes, including lower injury rates and higher compliance with safety protocols [1, 2].

To enhance the effectiveness of e-OHS-t, incorporating principles from Self-Determination Theory (SDT) presents promising opportunities. SDT focuses on intrinsic motivation and fulfilling basic psychological needs, such as autonomy, competence, and relatedness [3]. By integrating SDT principles into e-OHS-t, organizations can tap into employees' intrinsic motivation and create a more engaging learning experience. This involves providing choices to employees, supporting their sense of competence, and fostering a sense of connection and belongingness.

Research has shown that incorporating SDT principles in training contexts leads to positive outcomes, including increased motivation, engagement, and skill development [4, 5]. By aligning e-OHS-t with these principles, organizations can optimize the influence of the programs and promote a culture of safety.

To improve e-OHS-t using SDT principles, organizations can consider strategies that satisfy employees' basic psychological needs. This includes offering autonomy by involving employees in the training program's design and allowing them to choose relevant learning methods or topics. Fostering competence can be achieved through clear instructions, feedback, and opportunities for skill development. Additionally, promoting relatedness and belongingness within the training environment is crucial, encouraging collaboration and creating a supportive atmosphere.

By leveraging SDT principles, organizations have the potential to significantly enhance e-OHS-t. The integration of autonomy, competence, and relatedness into the training design and delivery enhances

motivation, engagement, and the application of learned skills. Ultimately, this contributes to a safer work environment and improved organizational outcomes.

Determining the qualitative nature of motivation (types of motivation, internalized extrinsic motivation and SDT continuum, Figure 1. [4, 6]) for e-OHS-t presents an opportunity to assess employees' motivation and satisfaction of fundamental Self-Determination Theory (SDT) needs. This understanding can be leveraged to enhance the design of e-OHS-t, ensuring that employees possess the desired qualitative characteristics of motivation for engaging in these trainings effectively in self-determined manner.

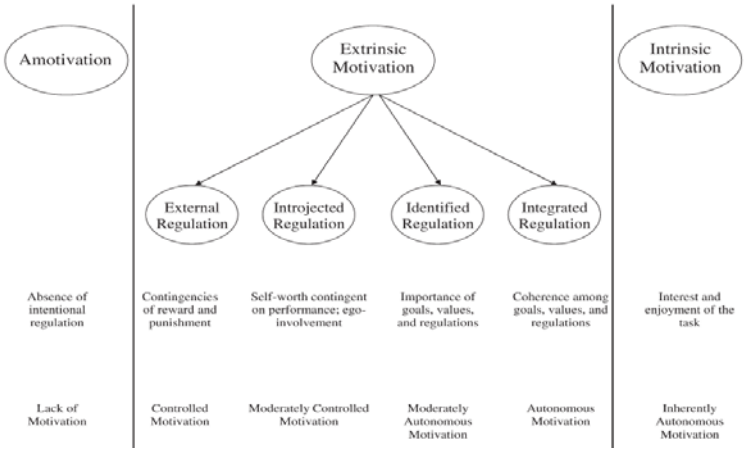


Figure 1. The SDT Continuum

By examining the current motivation types and assessing the fulfilment of SDT needs within the context of e-OHS-t, organizations can identify areas for improvement. This knowledge allows for targeted interventions and adjustments to the training programs, aligning them more closely with employees' intrinsic motivation, internalized extrinsic motivation and promoting greater engagement.

Taking into account the qualitative nature of motivation for e-OHS-t enables organizations to create training experiences that are meaningful, empowering, and relevant to employees' needs. By satisfying the fundamental SDT needs of autonomy, competence, and relatedness, organizations can optimize employees' motivation, leading to increased participation, knowledge retention, and application of learned skills in the workplace.

Ultimately, by incorporating a deeper understanding of employees' qualitative characteristics of motivation for e-OHS-t into the design and implementation of training programs, organizations can foster a culture of safety, enhance employee well-being, and achieve better outcomes in occupational health and safety [3].

2. METHODOLOGY

The employed methodology encompasses a combination of qualitative and quantitative scientific research methods to collect, organize, and analyse the requisite data. The sequential stages of this methodology are depicted in Figure 1, with specific details provided in the ensuing text. The methodology is comprised of four distinct stages: 1) gathering and scrutinizing relevant literature, 2) assessing the significance of employee Occupational Health and Safety trainings (e-OHS-t) in relation to work accident prevention, 3) identifying motivation types with respect to e-OHS-t, and 4) processing and analysing the data, followed by a discussion of the findings.

To address the scientific research challenges at hand, an initial examination of the existing literature regarding the importance of e-OHS-t and the qualitative aspects of individual employee motivation based on Self-Determination Theory (SDT) was conducted in Stage 1. This analysis forms the foundation for subsequent stages of the research methodology.

In Stage 2, e-OHS-t was analysed within the context of work accident prevention, encompassing both theoretical aspects and practical applications within Macedonian manufacturing companies. This analysis took place in three steps. Firstly, an exploration of the theoretical approaches to understanding work accident causation (TAUWACs) involved the collection, identification, and analysis of the relative occurrence frequency (f_o) of various TAUWACs. From a pool of 142 identified TAUWACs, 22 (Heinrich's Domino Theory, Swiss cheese model, Systems-theoretic accident model and process, Bird and Loftus' Domino Theory, Human factors analysis and classification system, The Rasmussen (socio-technical) framework, The Functional resonance accident method, Normal Accidents Theory, Cognitive reliability and error analysis method, Accident proneness theory, Energy release and transfer model, Skill-rule-knowledge framework, High Reliability Organization Theory, Drift Into Failure model, Epidemiologic Theory of Accidents, Tripod delta, Haddon's ten countermeasure strategies, Multiple Causation Model, Human Factor Theory, The Petersen accident-incident causation theory, Systems Theory of Causation: Theory of Accident Causation, Goals Freedom Alertness Theory: Dr. Willard Kerr's theory of accident causation) were selected

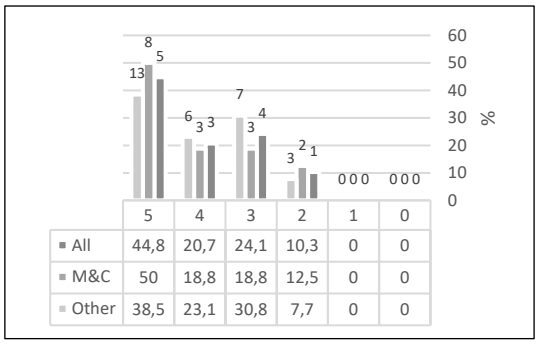
based on their cumulative occurrence frequency, which accounted for 70% of the total identified TAUWACs or TAUWACs with an occurrence frequency (f_o) equal to or greater than 0.9% ($f_o \geq 0{,}9\%$.). Secondly, the relevance of e-OHS-t as a mitigating factor for employees in work accidents was analysed and confirmed based on the postulates of the selected TAUWACs. Finally, an online expert survey was conducted among Macedonian OHS professionals to evaluate the influence of e-OHS-t on prevention of work accidents, employing a scale of 0 to 5 (0|This factor is not used., 1|Has no influence., 2|Has a negligible influence ., 3|Has an influence., 4|Has a significant influence., 5|Has a great influence.), as well as to determine the priority of e-OHS-t in comparison to other identified group factors, such as communication, feedback, information and OSH guidelines, workplace risk assessment, accident and injury investigations, internal acts and OSH objectives, continuous improvement of the OHS system, trainings and practical exercises, and selection of work equipment, employing a scale of 1 to 7 (1|highest priority and 7|lowest priority). The survey included 44 OHS professionals, with 29 providing complete responses, rendering them eligible for inclusion in the research. All surveyed OHS professionals possessed relevant experience in the field of OHS (6,9% have less than one year, 10,3% have from 1 to 5 years, 27,6% have from 6 to 10 years and 55,2% have more than 10 years' work experience; while regarding the work field, 51,7% have work experience in manufacturing industry [M], 13,8% as OHS consultancy [C] and 34,5% in other OHS field), and 96.6% of them had passed the OHS state exam in accordance with Macedonian law.

Stage 3 involved a survey of 70 frontline employees employed in four large Macedonian manufacturing companies in the metal processing industry. These companies had implemented the ISO45001:2018 standard and employed at least one OHS professional. The objective of this stage was to identify the qualitative dimensions, based on SDT, of individual employee motivation towards e-OHS-t. To achieve this, a questionnaire consisting of 16 statements was adapted from a previously established scale, as described in the [7, 8]. The respondents were asked to rate their agreement with each statement using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Lastly, Stage 4 encompassed the presentation and discussion of the results, contextualizing the understanding of employees' qualitative individual motivation, based on SDT, towards e-OHS-t. This knowledge contributes to the development of more effective e-OHS-t designs.

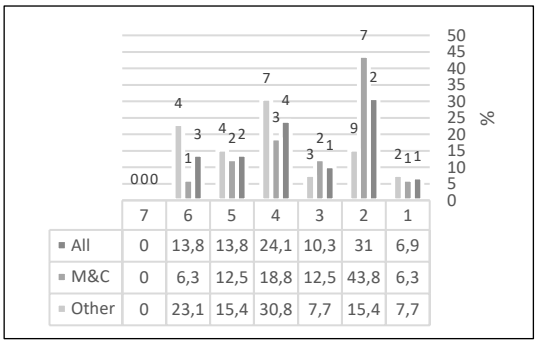
3. RESULTS

The analysis conducted on the relevance of e-OHS-t as a mitigating factor for employee influence on work accidents, whether as a cause or contributor, yielded a 96% correlation with the postulates of the selected 22 TAUWACs (21 TAUWACs). Figure 2 and Figure 3 present the processed data obtained from the expert survey, illustrating the evaluation of the influence and priority of e-OHS-t as mitigation factors by surveyed OHS professionals. Median values for the influence and priority are provided in Table 1 to offer a general summary. Table 2 displays the median values (from M_a to M_e) derived from the direct employee survey, specifically focusing on the type of motivation and internalised extrinsic motivation for e-OHS-t. The degree of agreement with identifying statements related to the type of motivation and internalised extrinsic motivation for e-OHS-t is captured in the survey, and Figure 4 showcases the distribution of answers regarding this agreement. Figure 5 presents a heatmap that represents the median values and values corresponding to the type and internalised extrinsic motivation per respondent. This visualization allows for a comprehensive understanding of the patterns and trends within the data set.



	5	4	3	2	1	0
All	44,8	20,7	24,1	10,3	0	0
M&C	50	18,8	18,8	12,5	0	0
Other	38,5	23,1	30,8	7,7	0	0

Figure 2: Influence of e-OHS-t as a mitigating factor on work accidents according surveyed OHS professionals



	7	6	5	4	3	2	1
All	0	13,8	13,8	24,1	10,3	31	6,9
M&C	0	6,3	12,5	18,8	12,5	43,8	6,3
Other	0	23,1	15,4	30,8	7,7	15,4	7,7

Figure 3: Priority given to e-OHS-t in relation to other groups of factors by surveyed OHS professionals

Table 1: Median values of the influence and priority of e-OHS-t according the surveyed OHS professionals

	All	M & C	Other
Median value of the influence of e-OHS-t on work accidents	4 (Has a significant influence .)	4 (Has a significant influence .)	4 (Has a significant influence .)
Median value of priority	3 1 (max) – 7(min)	3 1 (max) – 7(min)	4 1 (max) – 7(min)

Table 2: Median values of degree of agreement with the statements for identifying type of motivation and type of internalized extrinsic motivation for e-OHS-t per statement and type of motivation and internalized extrinsic motivation

	INTRINSIC MOTIVATION (a)				IDENTIFIED MOTIVATION (b)				INTROJECTED MOTIVATION (c)				EXTRINSIC MOTIVATION (d)				AMOTIVATION (e)				
QQ	1	2	3	M_a	4	5	6	M_b	7	8	9	M_c	10	11	12	M_d	13	14	15	16	M_e
M_{QQ}	2	3	3	3	4	4	4	4	3	3	3	3	2	3	2	2	2	2	2	2	2

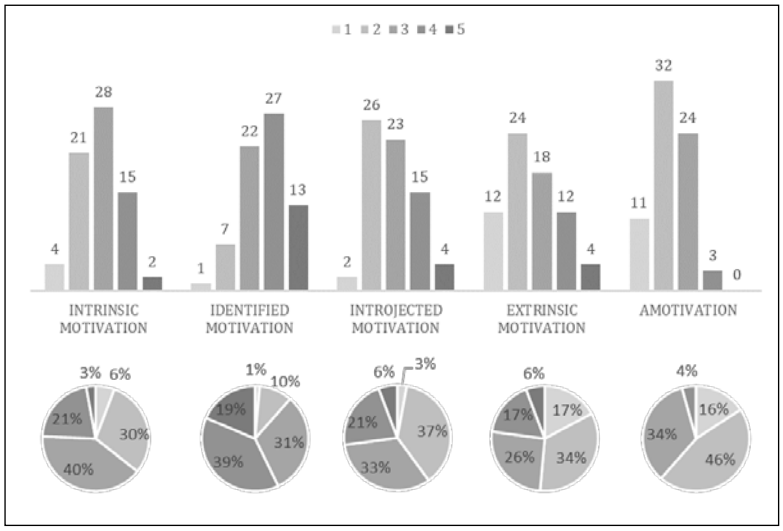


Figure 4: Distribution of answers regarding the degree of agreement with the statements for identifying type of motivation and type of internalized extrinsic motivation

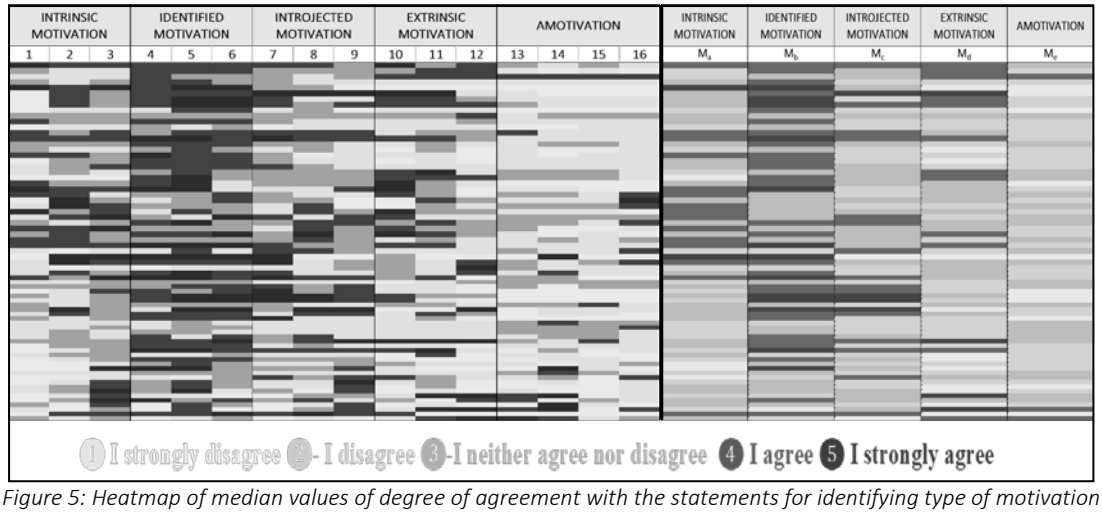


Figure 5: Heatmap of median values of degree of agreement with the statements for identifying type of motivation and type of internalized extrinsic motivation for e-OHS-t per respondent

4. DISCUSSION

This research aims to characterize the qualitative dimension of employee motivation, drawing upon the framework of the Self-Determination Theory (SDT), in manufacturing organizations located in the Republic of Macedonia. The findings of this study aim to contribute to a deeper understanding of employee motivation and aid in the enhancement of organizational approaches to the design of e-OHS-t.

Considering that the design of e-OHS-t depends on various factors relevant to the organizational context in which they are implemented, including employee motivation to participate in training, it is essential to strengthen their effectiveness and efficiency. The activities performed mentally or physically within any microenvironment where individuals exist, including the role of employees/workers in the workplace microenvironment, depend on two general aspects of motivation: quantitative (level of motivation) and qualitative.

The first two stages of the research (Stage 1 and Stage 2) involved an analysis of the significance of e-OHS-t for organizations in the context of preventing workplace accidents. This analysis was conducted based on the postulates of selected theoretical approaches aimed at understanding the occurrence of workplace accidents. It was found that 96% of TAUWACs, specifically 21 out of 22, included ways in which employees influence or contribute to the occurrence of workplace accidents, making e-OHS-t one of the mitigating factors. The importance of e-OHS-t was further confirmed through evaluation of their influence and priority on work accidents.

Figure 2 illustrates the distribution of data regarding the evaluated influence as perceived by OHS professionals. The data is divided based on the professionals' work area in OHS (All, M&C, and Other) and the degree of influence on accident prevention. From the graph, it is evident that all groups of OHS professionals evaluated the influence of training on accident prevention *as great significance (5)*, with 50% of professionals from M&C, 38.5% from other OHS areas, and 44.8% of all respondents rating it as having a great influence. Additionally, 18.8% of M&C professionals, 23.1% of professionals from other OHS areas, and 20.7% of all respondents rated it as *having a significant influence (4)*. Another 18.8% of M&C OHS professionals, 30.8% of professionals from other OHS areas, and 24.1% of all respondents rated it *as having an influence (3)*. The remaining percentages indicate no significant or no influence, with *none of the respondents considering that training has no influence on accident prevention*. Furthermore, Figure 3 shows that the majority of M&C professionals (43.8%) prioritize e-OHS-t as the second most important factor in accident prevention, while 18.8% place it fourth. This is followed by third and fifth place with 12.5% each, and first and sixth place with 6.3% each, with none ranking it as the least important. Considering the previous distributions, Table 1 provides the median values of all data from surveyed professionals. The median value for the influence of e-OHS-t on accident prevention as rated by M&C professionals is 4 (*Has a significant influence.*), the same as professionals from other OHS areas, and the overall median value for all respondents. Regarding the median value for priority based on the responses of M&C professionals, it is 3 of 7, while professionals from other OHS areas rated it as 4 of 7, and the median value for all responses is 4 of 7.

The third stage of the research aimed to identify relevant types of motivation and internalized extrinsic motivation for e-OHS-t. Table 2 presents the median values of responses indicating the level of agreement with statements (adapted from [7, 8]) related to different types of motivation and internalized extrinsic motivation.

The findings, presented in Table 2 (adapted from [7, 8]), indicate that all three statements related to the identified motivation received a median value of 4 (I agree.), indicating agreement. Statements 2, 3, 7, 8, 9, and 11 received a median value of 3 (I neither agree nor disagree.), indicating neutrality. Conversely, all other statements received a median value of 2 (I disagree.), indicating disagreement.

Figure 4 displays the distribution of median values for the types of motivation and internalized extrinsic motivation. The figure shows that for the identified motivation, 19% of employees strongly agree, 39% agree, 31% are neutral, 10% disagree, and 1% strongly disagree with the corresponding statements. Other types of motivation and internalized extrinsic motivation exhibit higher degrees of neutrality (intrinsic and introjected motivation) or disagreement (extrinsic motivation and amotivation).

Furthermore, Figure 5 visualizes individual results in a heatmap, highlighting the dominant agreement with statements concerning the identified motivation. While the individual results appear more scattered, they align more closely with the identified motivation when represented through median values.

5. CONCLUSIONS

In conclusion, this study emphasizes the crucial role of employee occupational health and safety trainings (e-OHS-t) in establishing and maintaining a safe work environment. However, it also recognizes that the mere provision of training is not sufficient to guarantee its effectiveness. To maximize the impact of e-OHS-t programs, it is essential to incorporate principles from Self-Determination Theory (SDT). By integrating SDT principles, organizations can tap into employees' intrinsic motivation and create a more engaging and empowering learning experience.

The research findings underscore the significance of e-OHS-t in preventing work accidents, as evidenced by the strong correlation with selected theoretical approaches to accident causation. OHS professionals acknowledge the substantial influence of e-OHS-t in mitigating workplace accidents. This recognition further reinforces the importance of prioritizing these trainings within organizations.

When assessing the qualitative dimensions of employee motivation, the survey of frontline employees revealed a higher agreement with intrinsic and identified motivation, as compared to extrinsic motivation and amotivation. This alignment with intrinsic motivation suggests that employees are more likely to engage in e-OHS-t when they perceive it as meaningful and enjoyable, driven by their own interests and values. By leveraging these findings, organizations can tailor their e-OHS-t programs to nurture intrinsic motivation, promoting active participation and sustained engagement.

By designing e-OHS-t programs that align with employees' intrinsic motivation, organizations can foster a culture of safety where individuals feel empowered and valued. These programs are more likely to elicit positive outcomes, such as increased knowledge retention, skill application, and adherence to safety protocols. Ultimately, the integration of SDT principles into e-OHS-t programs contributes to a safer work environment, enhanced employee well-being, and improved organizational outcomes.

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