Annals of Spiru Haret University.
Economic Series
Since 2000
ISSN:2393-1795 ISSN-L:2068-6900

Issue 4/2023

SYSTEMS THINKING IN WORKPLACE HEALTH AND SAFETY: A THEORY AND PRACTICE NEXUS

Francis Ezieshi MONYEI[1], Augustine Ebuka ARACHIE[2], Wilfred Isioma UKPERE[3]

[1]Department of Management, University of Nigeria, Nsukka, Nigeria Phone: +2348032731306, monyei_francis@yahoo.com

[2]Department of Business Management, Nnamdi Azikiwe University, Awka, Nigeria, Phone: +2347031622883,Email:ae.arachie@unizik.edu.ng

[3]Department of Industrial Psychology and People Management, School of Management, College of Business and Economics, University of Johannesburg, South Africa , Phone:+27-735295587; Email: wiukpere@uj.ac.za

How to cite: Monyei, F. E. , Arachie, A.E.& Ukpere W.I. (2023). "Systems Thinking in Workplace Health and Safety: A Theory and Practice Nexus". *Annals of Spiru Haret University. Economic Series*, *23*(4), 111-128, doi: https://doi.org/10.26458/2344

Abstract: *This paper undertakes a conceptual overview of system thinking in workplace safety and health with the intent of bridging the gap between theory and practice. It is based on the premise that there has been so much discussed in theory without very little to practice, thus, making the modern workplace more hazardous and challenging. This study relied on existing literature and based on the frame an emerging economy perspective was articulated and discussed. The paper draws from a narrative qualitative approach design. The study concludes that there is more to be done in practice when it comes to workplace health and safety. The reality that modern workplaces evolve from a system view thus demands a holistic approach to viewing workplace safety and health, as it remains foundational to employee retention and effective contribution to the survival of the workplace.*

Keywords: *System thinking, Dynamics, Health and Safety, Theory, Workplace*
Jel Classification: I10, I18, J28, L51, M12, M54, O15

Annals of Spiru Haret University.
Economic Series
Since 2000
ISSN:2393-1795 ISSN-L:2068-6900

Issue 4/2023

Introduction

In the past, concerns have been raised about the best ways for legislation to impact occupational health and safety (OHS) in the workplace, the relationship between OHS and other administrative functions, whether incident investigation findings contribute to incident prevention, and how or why human behaviour can deviate from norms in organisational operations. Vijaya and Ganesh (2020) claim that the complex systems that constantly emerge in our environment are growing at an unstoppable rate. Stressing that globalisation is creating new, complex ways for our social systems to grow as nations become more interconnected. System after system is created by technological innovation, and as time goes on, these systems become more and more dependent on one another (Internet, GPS, power grid, software APIs). Nations are connected by strong economic feedback loops created by international trade. Changes in one country's policies always have an impact on another. As we speed towards a globalised future, systems, if they were ever isolated, are unavoidably gravitating towards interconnection (Vijaya & Ganesh, 2020). These systems all interact with one another to produce incredibly intricate and unpredictable results. The phrase "systems thinking" is credited to Barry Richmond, a renowned pioneer in the fields of systems dynamics and systems thinking, in 1987. In 1991, he claimed that we need to acquire new learning strategies as our interdependence grows. Merely increasing our level of knowledge about our specific "bit of the rock" is insufficient (Vijaya & Ganesh, 2020, Boulding, 1956). However, to share our specialised knowledge, skills, and experience with "local specialists" from around the globe, we need to establish a common language and structure. Esperanto is required for such a system. Then and only then will we be capable of acting morally. In summary, systems thinking is necessary for interdependency, and without it, the evolutionary path that has led to our emergence from the primordial soup will become less and less feasible.

Recently, the concept of systems has been a valuable tool in the development of responses to these inquiries (Gunnigham & Johnstone, 1999). Maintaining a system's purpose and making sure it adapts to change calls for deliberate effort. Some examples of this include responding to changes in administrative staff, job patterns, or working hours. Systems consist of both constituents and dynamics (between and within the constituents). By employing a set of abilities known as systems thinking, people may be able to get a deeper comprehension of the fundamental causes of these intricate behaviours, which will help them make better

Annals of Spiru Haret University.
Economic Series
Since 2000
ISSN:2393-1795 ISSN-L:2068-6900

predictions and, in the end, modify their results. The demand for systems thinkers to address these challenging issues is developing as a result of the exponential rise of systems in our environment. This requirement encompasses all facets of life and extends well beyond the fields of science and engineering. More than ever, we need systems thinkers to get ready for a future where everything will have global repercussions and is a more sophisticated, globalised system of systems. This logic makes a compelling case for the idea that everyone who makes decisions ought to be well-versed in systems thinking. According to Hermanus (2007), stakeholder groups, OHS committees, policies, procedures, standards, auditing and monitoring protocols, and performance parameters are typical system components for occupational health and safety. The actions and interactions of these components—which include scheduling, fast incident response, leadership engagement and commitment, consultations and interactions with regulators, and taking action based on audit findings—highlight the dynamics of the systems. A competitive advantage can be gained from well-developed system units, but poor and ineffective system performance is likely to occur in the absence of positive dynamics (such as commitment, involvement, feedback, or responsiveness) (Gunnigham & Johnstone, 1999). Richmond's ideas regarding the critical role that systems thinking will play in addressing the complexity of the twenty-first century are shared by a large number of researchers and systems science experts (Bales, 2017). Over time, it has been increasingly clear that entities and people need to increase their capacity to comprehend complicated systems. There is a growing number of educators who feel that systems thinking is a response to this challenge and that it is more important than ever for the general people to be able to comprehend complexity and systems. There are a great deal more claims similar to this one in the literature. If these experts and leaders in the field are to be trusted, systems thinking is going to be critical to our future.

Systems thinking has recently been demonstrated by OHS laws, workplace initiatives, risk assessments, and accident investigations. According to law enforcement risk management expert Graham (2015), companies need to have sufficient procedures in place to identify and address concerns of the utmost priority. Systems for navigating risk and safety throughout the company are part of this. According to Graham (2015), effective system development and accurate system execution/implementation are necessary for both operational and organisational risk management. He went on to say that almost all organisations that are still in operation are those that are dedicated to their systems. It has been shown that there is still a significant gap between theory and practice, even though

Annals of Spiru Haret University.
Economic Series
Since 2000
ISSN:2393-1795 ISSN-L:2068-6900

the majority of organisations now see the benefits of using a system thinking approach within their own business. The prevalence of poor workplace health and safety remains high across the nation, particularly in business companies (Graham, 2015). This study is motivated by the tendency and the necessity to bridge the gap in the observed literature that has created a chasm between theory and reality in contemporary organisations.

Objective

illustrate the nexus between system thinking and workplace health and safety management

Review of Related Literature

Theoretical Foundation

The normal accident theory and the Swiss cheese theory serve as the fundamental lenses that are used to evaluate this research. As the foundation that the study benchmarked, this theory offers the study's fundamental basis.

Normal Accident Theory

According to Perrow (1980), accidents are inevitable and should be anticipated in any system that has intimate coupling between its constituent parts and interaction complexity. The hypothesis is predicated on the idea that accidents result from little events that spiral out of control and that individuals make mistakes. According to the normal accident theory, an organization's objective should be to reduce mistakes and errors rather than to entirely prevent them because not all incidents can be predicted, particularly in high-risk industries like security and defence where there are a lot of unknowns. Developing a complete understanding of the causes and effects of accidents and implementing policies and programmes to address them is the key to enhancing safety and minimising injuries, (ibid). This is akin to the risk assessment procedure that law enforcement professionals understand as the detection of potential issues (Graham, 2015). Due to a significant shift, zero-injury goals are now a crucial component of workplace safety policies in many organisations. Instead of creating a supportive environment where workers can get important insights from near-misses and mistakes, zero-injury goals instil dread and worry in them (Merilatt, 2015). As a result, implementing a zero-injury tolerance policy hinders the growth of good safety practices and has unfavourable effects, such as making employees reluctant to report safety concerns for fear of facing disciplinary action. Given the

Annals of Spiru Haret University.
Economic Series
Since 2000
ISSN:2393-1795 ISSN-L:2068-6900

uncontrollable nature of events, the inherent dangers of a profession, and the possibility of injury from a variety of threats, the Normal Accident Theory offers a framework for management to take into consideration. Improving the safety culture in the workplace requires realising that mishaps, injuries, and fatalities can occur, learning from errors and near misses, and creating policies and programmes that assist in identifying and lowering risks.

The Swiss Cheese Theory

The Normal Accident Theory from the literature is strongly related to the Swiss Cheese theory. It is said or seen that defensive leakage(s) is/are the cause of mishaps. According to Reason's (1990) Swiss Cheese Theory, these leaks happen as a result of impending failures or possible threats that go unnoticed. A police officer who disobeys a mandatory directive, such as wearing a seatbelt or bulletproof vest, or who drives over the speed limit while responding to an emergency call, is considered to have committed an exemplary failure. While management's actions, policies, and procedures create potential risks within an organisational system. A security agency's vehicle operations policy that does not impose penalties or limitations on its employees' inappropriate driving behaviours is an example of a prospective or latent danger condition. Until they combine with an impending breakdown that causes an accident, these potential risks are frequently dormant or passive. When something like this happens, the company investigates the individual as well as the system to determine the source, how to mitigate it, and how to prevent it in the future. According to Graham (2015), there are two reasons why accidents happen: a direct cause and an impending issue that is waiting to happen. He notes that frequently, the organisation tries to place the blame on specific events or actions that happen right before the accident—a process known as proximate cause. An example would be a soldier hurting their knee during defensive tactics training. Additionally, situations in the workplace that employees knew about or should have known about but ignored could be the cause of problems that lie in wait. These conditions are thought to be predictable and predictive. In this instance, training was taking place on a hard area devoid of protective matting when the soldier was hurt. Thus, the occurrence results from a confluence of the immediate cause (soldier sustains knee injury during training) and issues that were lying in wait (inadequate training equipment). The only way to prevent an incident from happening again is to implement efficient control measures, such as procedures and/or policies that deal with the issues that are just waiting to happen and stop them from happening again (ibid).

Annals of Spiru Haret University.
Economic Series
Since 2000
ISSN:2393-1795 ISSN-L:2068-6900

Conceptual Clarifications

System Thinking (ST)

To successfully create and implement a workplace safety programme, it's critical to comprehend the causes of accidents from both an individual and a process perspective. Understanding the causes and effects of risky workplace behaviours is essential for developing an effective safety management system and culture (Hirsch, 2004). It's critical to comprehend what makes up a system to comprehend the newly popular idea of systems thinking. A system is described by the Merriam-Webster Dictionary as an assembly or collection of related parts that move or function as a unit; closely related, interdependent parts that come together to form a single, cohesive whole. In contrast, the Oxford Dictionary saw it as a collection of interconnected parts that made up a whole. An assembly of connected parts serving a common goal is referred to as a "system." Policies, norms, organisations, people, and machinery are examples of components. However, one crucial feature of systems is their dynamic nature, which means that they alter in response to changes in their constituent parts. The renowned pioneer in the subject of systems dynamics, Barry Richmond, used the phrase "systems thinking" for the first time in 1987. The study and design of the whole as opposed to the components are the main foci of systems thinking. Long-term planning, feedback loops between different components, and collaborative planning or execution of all organisational aspects are characteristics of systems thinking (Graham, 2015). When it comes to complicated difficulties, such as those arising from inefficient coordination among parties involved or occurrences that depend on the actions of others, systems thinking is thought to be most effective. By analysing the interrelationships between the various system components, a systems approach to understanding why incidents occur allows for a full and in-depth investigation of incident causation. According to Marais, Dulac, and Leveson (2004), a systems approach to safety acknowledges that safety is a feature of the system overall rather than a characteristic of its parts. They went on to say that a systems approach examines the organization's problems from a wider angle to understand what went wrong and contributed to the occurrence. Systems thinking differs from classical analysis, which investigates systems by disassembling them into their parts, as noted by Aronson (1999). Instead of the traditional approach of addressing safety in terms of personnel behaviour and a singular focus on specific high-risk areas, this opinion suggests that law enforcement organisations should change the way and manner in which they address safety problems by taking a broader and systematic view of organisational safety. There is no denying the significant social and economic

effects that occupational illnesses and injuries have on workers, their families, and society as a whole. The direct and indirect costs incurred by society as a whole represent the economic effects. A range of 1 to 3 per cent of GDP has been calculated as the total costs of workplace diseases and accidents in different nations (Rikhardsson, 2004; Leigh, Markowitz, Fahs, Bernstein & Landrigan, 1992). Costs for compensation, damages, and work disruption are all considered direct expenditures. The costs of missed livelihoods, dependents' income, and the expenses incurred by families and society as a whole when providing care are all considered indirect expenditures. Although external indirect costs are disproportionately felt by distressed communities, organisations may also experience reputational damage and a decline in capital investment. A safe and healthy workplace is one of the basic expectations for sustainability, as seen from a larger viewpoint of sustainable development; this is the expectation that workplace hazards won't rob workers of their means of subsistence or their level of living. Incidents at work and health risks can have an impact on the environment or public health and safety. These circumstances or elements connect the larger societal agenda for development sustainability with measures to limit occupational health and safety (Hermanus, 2007).

Workplace Processes as Inputs for the Creation of a System Thinking

ST cannot be generated with only resource inputs. This is because resources—whether they be financial, human, technological, or social—never generate capabilities unless they are employed towards a certain goal. Take an accounting firm as an example of a professional service organisation. If its goal is to recognise each employee's unique contribution, it needs to create work environments that inspire and motivate each worker. Talent management as an ST may result from this being made possible by a clearly defined set of goals, planning, and staff incentives (Azadegan, Bush, & Dooley, 2008; Helfat & Peteraf, 2015). Another illustration would be high-tech manufacturing businesses. They rely heavily on ongoing technological advancements, which are critical to their survival. However, to connect them through new routines and cohesively coordinate engineering tasks, their technological resource investments require an integration procedure. In this situation, coordination and integration procedures become crucial. Therefore, in addition to resources, workplace procedures are needed to produce ST. Stated differently, workplace procedures serve as rigid routines that provide resource direction. Furthermore, because workplace procedures allow for systemic resource binding, they hinder competitor replication (Eisenhardt & Martin, 2000). It can be

Annals of Spiru Haret University.
Economic Series
Since 2000
ISSN:2393-1795 ISSN-L:2068-6900

difficult to implement systemic changes in the workplace and across inter-organizational links when replicating or mimicking processes (Teece & Pisano, 1994). Furthermore, sensing, seizing, and transforming are fundamental workplace learning activities on which ST is by definition based. Therefore, when we talk about processes, we're talking about how things work in the company, or what you could call its routines or patterns of current practice in terms of giving the direction and purpose of the resource. Workplace processes are determined by a firm's resource positions and evolutionary routes, which help to explain the core of the competitive advantage that ST could provide. Workplace procedures therefore act as an input aspect in the development of the ST (Teece & Pisano, 1994).

Environmental Dynamics as Input for the Creation of a System Thinking

How to match a firm's internal resources, procedures, and competencies to the external environment is a crucial problem in the field of strategic management (Li & Liu, 2014). A company's environment is the totality of physical and social elements that are taken into consideration in the decision-making behaviour of individuals in the organisation. The inherent uncertainty brought on by different environmental conditions is known as environmental dynamics. Environmental dynamics are influenced by several actors, including suppliers, competitors, customers, regulators, and new entrants. Wijbenga and Van Witteloostuijn (2007), for instance, define environmental dynamics as the pace at which customer preferences and organisational products evolve. It is suggested that ST actively combat environmental change, implying that environmental dynamism plays a pivotal role. An ST is a company's capacity for methodically resolving issues, which is shaped by its inclination to recognise possibilities and dangers and to make prompt, market-driven decisions (Barreto, 2010). It is noted that company transformation is a reflection of being responsive to external contexts in an empirical study done among specific enterprises in the United Kingdom. Haier's expansion in China serves as another excellent illustration of how to enable ST to react to various environmental changes. As a result, an ST is developed in businesses in response to a specific change demand that results from environmental dynamics. Theorising environmental dynamics as an input component to an ST makes sense as a result. This reasoning, however, is only applicable in extremely erratic markets when environmental dynamics are important. ST most likely does not form in a comparatively steady environment. Because of the maintenance costs involved, the establishment of ST could be costly or even disastrous in these situations (Schrey¨ogg & Kliesch-Eberl, 2007).

Annals of Spiru Haret University.
Economic Series
Since 2000
ISSN:2393-1795 ISSN-L:2068-6900

Issue 4/2023

Influence of Environmental Factors/Dynamics on System Thinking

Through adjustments to its heterogeneous structures and in response to changes in the environment, a firm's ST should allow it to adapt to its surroundings and achieve a strategic fit (Teece, 2011). (Schilke, 2014). To adapt to changes in the environment and achieve a state of equilibrium where they can completely respond to environmental dynamics, firms employ a variety of interactions amongst ST. This phenomenon is known as "equifinality" in the literature on systems thinking, where a given end state can be attained via a multitude of possible ways. Equifinality is demonstrated via open systems. Managers of companies, for example, utilise different STs to start responding to external dynamics from different beginning points and follow distinct courses. However, the ST permits equifinality since the objective is to provide a competitive advantage (Eisenhardt & Martin, 2000). A corporation that follows this approach will reach an equilibrium where it will fully understand its economic rationality in markets. Here, "equilibrium" refers to the state of being in balance with the changes in the environment, or fully responding to them. In dynamic markets, however, this equilibrium will only be a transient phenomenon. By reintroducing environmental dynamics, several environmental factors (such as changing consumer demands, governmental regulations, new competitors, and shifting competitor positions) upset the equilibrium (Uotila, 2018). Numerous internal (endogenous) and external (exogenous) elements affect the system's thinking during this process. The system is typically brought into a "far-from-equilibrium" condition by these causes.

Management of Health and Safety System

To get deeper into the details of this discussion, we will examine the notion of a management system. A management system, according to Haight, Yorio, Rost, and Willmer (2014), is a collection of connected parts that are used to create goals and policies as well as how they are to be achieved. Organisational structure, planning duties, practises, procedures, processes, and resources are all included in the management system. According to some, it's a framework and collection of rules, guidelines, regulations, and/or practises that a company uses to carry out tasks effectively and methodically or to accomplish its declared goals. To handle revenue and debt, for example, an organisation may employ accounting and financial management systems. These systems integrate staff, software, and interdependent processes to identify, record, and track revenue/income, issue invoices, and guarantee that the company's debts are paid. Together, the investment, tax, and debt management components of this management system guarantee that the

Annals of Spiru Haret University.
Economic Series
Since 2000
ISSN:2393-1795 ISSN-L:2068-6900

organization's financial objectives are met. One could contend that a systems thinking approach to management can be categorised according to a shared goal and strategic interdependence, as well as the framework required to guarantee their overall efficacy (Plummer, Strahlendorf & Holliday, 2000). According to Haight et al. (2014), an organization's health, safety, and management system (OHSMS) is considered a component of the management system used by the organisation to create and carry out its occupational health and safety (OH&S) policy and manage risks. Because occupational safety and health hazards involve a complex physical, cognitive, and/or behavioural phenomenon that is evident in both natural and artificial environments, an OHSMS may be direct, precise, and targeted (Plummer et al., 2000). Therefore, a proactive management system that can handle such complexities would be a key component of a targeted and successful mitigation plan. The activities that go into a typical safety and health programme, including behavioural safety observations, safety training, and other safety-based non-conformance activities, can be used as a conceptualization or image of an OHSMS (The US Centres for Disease Control, 2013).

Prevention System

The idea that there is also a prevention system is typically what springs to mind when one hears the term or concept of "health system." The OHS unit in organisations plays a part in educating employees about the components of the workplace preventive system and assisting in the development of better ways to connect the many components to achieve more effective, efficient, and fair health outcomes. According to the US Centres for Disease Control (2013), the public health system is made up of all governmental, corporate, and nonprofit organisations that support the supply and delivery of necessary healthcare services in a community. Similar to this, the Australian public health system is described as consisting of networks, organisations, or groups whose main responsibility is to organise, coordinate, and carry out public health initiatives or schemes (The Australian Prevention Partnership Centre (TAPPC), 2014).

Systems Approach to Prevention

In recent years, a wide range of publications, including books, websites, journal articles, and scholarly articles, have progressively focused on systems thinking. It's also typical to use language informally without consulting definitions. The various ways that academics, professionals, and researchers seem to apply system concepts to prevention are captured in the following.

Annals of Spiru Haret University.
Economic Series
Since 2000
ISSN:2393-1795 ISSN-L:2068-6900

(1) Applying methodical preventive measures

The process of turning a periodic or one-time programme and investment in public health infrastructure into a continuous pattern of service delivery is implied by this facet of "Being systematic about prevention" (Milat, King, Bauman and Redman, 2012). Changes in fund-raising practice, hiring and assigning of staff, responsibility and reporting standards, and the acquisition of information and data for decision-making could all be part of this. This feature aims to improve accountability, efficiency, and dependability.

(2) Realising that the environments in which preventive action is implemented—such as companies, communities, and schools—are environmental systems

According to Tseng and Seidman (2007), this aspect of the systems approach sees communities, workplaces, and schools as environmental systems unto themselves. By better comprehending the systemic nature of these settings—that is, their interactions and dynamic complexity—safety health prevention practises can be made more effective.

When it comes to health sensitization, environmental practises typically go beyond just acting on several levels. This is because they entail comprehending the general dynamics of the system, figuring out how its constituent parts interact, and speculating on how an intervention can lead to a change at the systems level. Research in this field thus aims to ascertain how an intervention functions in conjunction with the local system (e.g., how it integrates into local customs and discourse), reversing roles and relationships, sharing resources, and replacing previous activities. This is a step up from earlier working approaches that saw workplaces, schools, and communities solely as spaces where individuals might engage and receive prevention intervention techniques. Stated differently, the approach used by Baron, Beard, Davis, Delp, Forst, Kidd-Taylor, and Welch (2014) is that environmental systems thinking aims to fully utilise the power present in the system to create and maintain change processes.

(3) Explicit application of systems ideas and methods to the analysis and enhancement of preventative measures

This expands on the prior classification by incorporating techniques and concepts that were not originally applied in the field of public health. Although ecological or environmental systems thinking has long been important in the field of health promotion, preventionists have only lately begun to develop more

Annals of Spiru Haret University.
Economic Series
Since 2000
ISSN:2393-1795 ISSN-L:2068-6900

advanced systems techniques. Techniques and approaches from systems thinking have been applied to:

1. Use theory/model approaches to conceptualise the emergence and propagation of public health concerns, viewing them as the result of dynamic interactions between the components of a larger, complex system. Identifying systemic forces that might either enhance or reduce expected benefits is another way to increase the efficacy of a new or existing programme.

2. Plan for both expected and unexpected outcomes so that they can be included in evaluation designs that explain the environments in which policies and programmes are developed. Additionally, methods that illustrate how the dynamics of the local setting may support or contradict the intervention (The Australian Prevention Partnership Centre (TAPPC), 2014).

The Theory and Practice Nexus
(An Integration of Academic and Workplace Learning)

Learning from experiences in a real-world context is not the same as learning from experiences in a classroom. For example, the majority of the skills learned during off-campus deployments and placements are behavioural or human relations skills including time management, proper work ethics, interpersonal communication, and the growth of a professional sense (Fleming, Zinn, & Ferkins, 2008). It is generally agreed upon that exposure to both academic and professional environments is optimal for the development of strong professional knowledge, abilities, and attitudes because each has advantages and disadvantages and can even be considered complementary. Despite the abundance of literature on learning in the workplace, there is a lack of research on how to explicitly combine learning from the workplace with learning from academic settings. Examples of such connecting activities are especially hard to come by. This raises the possibility that, in many real-world situations, chances to expand and change the knowledge gained from both contexts are missed. According to proponents of social learning theory, social interaction is essential to learning (Brockbank & McGill, 2007). According to the majority of reflective learning theories, transformative learning requires reflective discourse (Mezirow, 1991). Employees had the chance to consider what they had learned in the learning environment, draw clear connections to the curriculum, evaluate each other's work through semi-structured discussions, and compare and contrast experiences. The seminar changed the students' opinions on the worth of chiropractic practice and reinforced course concepts. Research has indicated that participation in many forms of debate can help people gain a deeper

Annals of Spiru Haret University.
Economic Series
Since 2000
ISSN:2393-1795 ISSN-L:2068-6900

comprehension of ideas (Back, Arnold, Tulsky, Baile, & Fryer-Edwards, 2003). A deeper comprehension of learning experiences might be attained via group reflections as opposed to solitary contemplation (Johns, 2000). In this instance, talking with coworkers could have helped the employee grasp more ideas about evidence-based practice and the importance of communication in client interaction. The post-placement seminars offered students a highly appropriate platform to contemplate their acquired knowledge and experiences. Additionally, they had the opportunity to exchange ideas and experiences with one another, which was seen as a very beneficial experience—especially by the students who chose not to take part in the abroad placement. The additional knowledge that staff members get from the seminars can be applied to their year-long placement, as well as their community service postings. Therefore, the post-placement seminar consolidates for these workers the process of learning about chiropractic that started in the workplace and was further reinforced during placement. The high proportion of staff seminar engagement provides compelling evidence for the study. However, the results cannot be applied to workers in other organisations because the study only included a small group of people from one particular company. Survey responses regarding how the seminar influenced their thoughts and how chiropractic aligned with their values or interests. Demonstrating the occurrence of certain ideas, practises, and dispositional learning, but not being supported by an objective measurement such as a formal assessment.

Findings

Based on the ethnographic outcome of this study, it is revealed that there exists a nexus between system thinking and the health and safety of workplaces. Furtherance of this result indicates the existence of two links between workplace processes through a thorough analysis of the literature. First, the study conducted by Capaldo (2014), and Saenz, Revilla, and Knoppen (2014) documented procedures that use personnel, facilities, and equipment to conduct a workplace's daily operations. According to Teece (2011), they are operational procedures that assist in transforming workplace resources into desired outputs. Second, because ST is based on behavioural theory, workplace learning and management decision-making processes serve as its foundations (Helfat et al., 2009). This suggests that behavioural processes are input components that help construct workplace safety through ST. Examples of behavioural processes that serve as input elements in the construction of the ST system are presented in recent works by Helfat and Peteraf (2015). A review of the literature reveals several exogenous and endogenous

Annals of Spiru Haret University.
Economic Series
Since 2000
ISSN:2393-1795 ISSN-L:2068-6900

variables that affect system thinking. According to studies by Bingham et al., 2015; Fainshmidt and Frazier, 2017; and Martin, 2011, endogenous factors include health and safety, workplace culture, firm size, and managerial styles. According to studies by Girod & Whittington (2017), and Li, Wu, & Holsapple (2015), exogenous factors include the influence of competitors, influence from suppliers and customers, market influence, and social, economic, regulatory, and legal factors. Furthermore, a firm's positions, procedures, and trajectories are impacted by these influencing elements (Teece et al. 1997). Firms advance on their ST once again to gain a balance with the new environment as a response to this new stage of environmental dynamics (Newey & Zahra, 2009).

Conclusion

Organisational Health and Safety Management Systems (OHSMS) are gaining traction due to industry-wide initiatives and a substantial legislative consensus. Structures, integration, and a single goal that were constrained by the conventional approach are established by an OHSMS. Agbaeze, Monyei, and Agu (2017) assert that an effective organization's culture should integrate personnel into its system thinking, meaning that any OHSMS's performance is primarily dependent on maintaining a constant organisational culture. This entails robust administrative and managerial backing, along with proactive staff involvement. To be fair, though, none of these are simple to establish, measure, or maintain. After conducting a comparative analysis, it has been determined that an organisation can depend on certain intervention events that utilise pre-existing safety initiatives as the foundation for implementing an OHSMS. It has been discovered that the level of effort put into implementing OHSMS elements can be accurately measured by looking at the percentage of available work hours that are assigned to this task. Furthermore, it has been shown that fluctuations in the level or extent of effort can also affect incident rates (Oyewole, 2009). Measurable intervention activities are those that are part of an OHSMS and also aim to prevent incidents. The importance of OHSMS activity quality measurements for the performance variables has been highlighted by more recent research. Scores on safety training tests, the rate at which inspection non-conformance results are corrected, and the results of perception surveys regarding the status of the organisational culture and its suitability for safer modes of operation are examples of quality metrics to take into account. Whatever method an organisation uses to determine the effectiveness of its OHSMS, it must evaluate those aspects over time to spot trends and create accurate documentation for each OHSMS component and intervention's long-term

consequences. Finally, statistical analysis of these metrics and their impact on incidence rates will be required for validation. Following measure validation, the organisation will be able to forecast injury prevention performance based on OHSMS changes to the allocated or discontinued amounts with demonstrated levels of accuracy of roughly 68% to 70%. Preventing occupational injuries is the primary goal of every safety and health method or plan, and thus much is still evident. Thus, even if experts in Safety, Health, and Environment are currently investigating methods to prove that what practitioners are doing is truly effective, efforts to keep staff safe are worthwhile.

References

[1] Agbaeze, E. K., Monyei, F. E. & Agu, A. O. (2017). Impact of talent management strategies on organizational performance in selected deposit money banks in Lagos state, Nigeria. *International Research Journal of Management, IT & Social Sciences* (IRJMIS). 4(2). http://ijcu.us/online/journal/index.php/irjmis.

[2] Arnold, R.D., & Wade, J.P (2015). A definition of systems thinking: A systems approach. *Procedia Computer Science,* 44, 669–678. https://doi.org/10.1016/j.procs.2015.03.050

[3] Azadegan, A., Bush, D., & Dooley, K. J. (2008). Design creativity: static or dynamic capability? *International Journal of Operations & Production Management, 28*(7), 636-662.

[4] Back, A. L., Arnold, R.M., Tulsky, J.A., Baile, W.F., & Fryer-Edwards, K.A. (2003). Teaching communication skills to medical oncology fellows. *Journal of Clinical Oncology,* 21(12), 2433-2436. DOI: 10.1200/JCO.2003.09.073

[5] Bales, R. (2017). *Social interaction systems: Theory and measurement*. New Jersey: Transaction Publishers.

[6] Baron S, Beard S, Davis L, Delp L, Forst L, Kidd-Taylor A, & Welch L. (2014). Promoting integrated approaches to reducing health inequities among low-income workers: Applying a social-ecological framework, *American Journal of Industrial Medicine,* 57(5), 539-556. https://www.ncbi.nlm.nih.gov/pubmed/23532780

[7] Barreto, I. (2010). Dynamic capabilities: A review of past research and an agenda for the future. *Journal of Management, 36*(1), 256-280.

[8] Boulding, K.E. (1956). General systems theory: The skeleton of science. *Management Science, 2*(3), 197-208.

[9] Brockbank, A., & McGill, I. (2007). *Facilitating reflective learning in higher education* (2nd ed.). New York, NY: Open University Press.

[10] Checkland, P. (1999). *Systems thinking: rethinking management information systems*. New York. NY: Oxford University Press.

[11] DeBoard, M.A. (2015). *Applying systems thinking to law enforcement safety: recommendation for a comprehensive safety management framework.* A Thesis presented to the Naval Postgraduate School, Monterey, California, USA. https://www.hsdl.org/?view&did=790320

[12] Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: What are they? *Strategic Management Journal, 21*(10-11), 1105-1121.
[13] Fleming, J., Zinn, C., & Ferkins, L. (2008). *Bridging the gap: Competencies students should focus on during their cooperative experience to enhance employability.* Paper presented at the WACE/ACEN Asia Pacific Conference, Sydney, Australia. http://dro.deakin.edu.au/view/DU:30020961
[14] Graham, G. (2015). *American Law Enforcement 2015: Risk management for executives in Virginia law enforcement.* Presented at the Virginia Association of Chiefs of Police (VACP) Annual Conference at The Williamsburg Lodge in Williamsburg, V A. https://www.dcjs.virginia.gov/sites/dcjs.virginia.gov/files/publications/law-enforcement/7th-edition-virginia-law-enforcement-accreditation-program-manual.pdf
[15] Graham, G. (2015). *Domestic security 2015: Organizational success and leadership challenges*. Lecture handout, Fusion Center Leaders Program, Monterey, CA. https://www.chds.us/c/academic-programs/fclp
[16] Gunnigham, N. & Johnstone, J. (1999). *Regulating workplace safety; Systems and sanctions.* Oxford University Press. 36–43.
[17] https://global.oup.com/academic/product/regulating-workplace-safety-9780198268246?cc=us&lang=en&
[18] Haight, J.M., Yorio, P., Rost, K.A. & Willmer, D.R. (2014). Safety management systems; comparing content and impact. *Journal of Professional Safety*. Retrieved online at: https://coresafety.org/resources/safety-systems.pdf
[19] Helfat, C. E., & Peteraf, M. A. (2015). Managerial cognitive capabilities and the microfoundations of dynamic capabilities. *Strategic Management Journal, 36*(6), 831-850.
[20] Hermanus, M.A, (2007). Occupational health and safety in mining status, new developments, and concerns, *The Journal of The Southern African Institute of Mining and Metallurgy.* 107**.** http://www.thinking.net/Systems_Thinking/OverviewSTarticle.pdf.
[21] Johns, C. (2000). *Becoming a reflective practitioner*. Oxford, UK: Blackwell Science. https://www.wiley.com/enus/Becoming+a+Reflective+Practitioner%2C+3rd+Edition-p-9781119101000
[22] Leigh, J.P., Markowitz, S.B., Fahs, M.C., Bernstein, J., & Landrigan, P. (1992) Costs of Occupational Injuries and Illnesses, Chapter 1. University of Michigan Press. https://www.researchgate.net/publication/13982357_Occupational_Injury_and_Illness_in_the_United_States_Estimates_of_Costs_Morbidity_and_Mortality
[23] Li, D. Y., & Liu, J. (2014). Dynamic capabilities, environmental dynamism, and competitive advantage: Evidence from China. *Journal of Business Research, 67*(1), 2793-2799.
[24] Marais, K., Dulac, N. & Leveson, N. (2004). *Beyond normal accidents and high-reliability organizations: the need for an alternative approach to safety in complex systems*. Paper presented at Engineering Systems Division Symposium, MIT, Cambridge, MA. http://sunnyday.mit.edu/papers/hro.pdf

[25] Merilatt, S. (2015). *How to Motivate Employees through the Language of Workplace Safety*. *EHS Today*. https://www.ehstoday.com/safety-leadership/how-motivate-employees-through-language-workplace-safety

[26] Mezirow, J. (1991). *Transformative dimensions of adult learning*. San Francisco, CA: Jossey-Bass. https://doi.org/10.1177/074171369204200309

[27] Milat, A.J, King, L., Bauman, A.E. & Redman S. (2012). The concept of scalability: increasing the scale and potential adoption of health promotion interventions into policy and practice, *Health Promotion International,* 1(14). Doi: 10.1093/heapro/dar097 *Oxford Dictionary,* s.v. "system", accessed Oct. 24, 2018.

[28] Oyewole, S.A.(2009). *The implementation of statistical and forecasting techniques in the assessment of safety intervention effectiveness and optimization* (Unpublished doctoral dissertation).Pennsylvania State University, University Park, PA. *https://scholar.google.co.uk/citations?user=25t_WSEAAAAJ&hl=en*

[29] Plummer, I., Strahlendorf, P., & Holliday, M. (2000). Excerpt from: The Internal Responsibility System in Ontario Mines. Final Report: The Trial Audit and Recommendations. Full report from webirs@mol.gov.on.ca.p. 28. http://www.ontla.on.ca/library/repository/mon/25008/312143.pdf

[30] Richardson, P.L. (2004) Corporate Social Responsibility and Environmental Management, Accounting for the Cost of Occupational Accidents. vol. 11, pp. 63–70. doi.org/10.1002/csr.52.

[31] https://onlinelibrary.wiley.com/doi/abs/10.1002/csr.52

[32] Schilke, O. (2014). On the contingent value of dynamic capabilities for competitive advantage: The nonlinear moderating effect of environmental dynamism. *Strategic Management Journal, 35*(2), 179-203.

[33] Schrey¨ogg, G., & Kliesch-Eberl, M. (2007). How dynamic can organizational capabilities be? Towards a dual-process model of capability dynamization. *Strategic Management Journal, 28*(9), 913-933.

[34] Teece, D. J. (2011). Achieving integration of the business school curriculum using the dynamic capabilities framework. *Journal of Management Development, 30*(5), 499-518.

[35] Teece, D., & Pisano, G. (1994). The dynamic capabilities of firms: An introduction. *Industrial and Corporate Change, 3*(3), 537-556.

[36] The Australian Prevention Partnership Centre (TAPPC), (2014). What is systems thinking and how does it apply to prevention in TAPPC? *A Discussion Paper prepared by the Systems Science and Implementation Capacity*. https://preventioncentre.org.au/wp-content/uploads/2015/02/Systems-thinking-paper1.pdf

[37] The US Centres for Disease Control (2013). *United States Public Health* 101. https://www.cdc.gov/nchs/data/hus/hus13.pdf

[38] Tseng V. & Seidman E. (2007). A systems framework for understanding social settings, *American Journal of Community Psychology,* 39(3-4), 217-228. https://psycnet.apa.org/doi/10.1007/s10464-007-9101-8
[39] Uotila, J. (2018). Punctuated equilibrium or ambidexterity: Dynamics of incremental and radical organizational change over time. *Industrial and Corporate Change, 27*(1), 131-148.
[40] Vijaya, S.M. & Ganesh, L.S. (2020). Identification of the dynamic capabilities ecosystem — A systems thinking perspective. *Group & Organization Management*, *0*(0), 1–38. DOI: 10.1177/1059601120963636
[41] Wijbenga, F. H., & VanWitteloostuijn, A. (2007). Entrepreneurial locus of control and competitive strategies: The moderating effect of environmental dynamism. *Journal of Economic Psychology, 28*(5), 566-589.