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THE IMPACT OF OCCUPATIONAL SAFETY AND HEALTH (OSH) TRAINING ON FOSTERING A CULTURE OF SUSTAINABILITY IN THE WORKPLACE: A CONCEPTUAL PAPER

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ABSTRACT

Occupational Safety and Health (OSH) training has emerged as a key component in fostering workplace sustainability by promoting safety, health, and environmentally responsible practices. This study explores the role of OSH training in driving sustainability by examining its influence on employee awareness, behavioural change, and organizational policies. The conceptual framework developed in this paper highlights how OSH training contributes to sustainability goals through mechanisms that enhance workplace safety while aligning with environmental and social responsibility initiatives. Despite the potential benefits, challenges such as organizational resistance, resource constraints, and regulatory complexities hinder the effective integration of OSH training with sustainability. This study also discusses theoretical, practical, and policy implications, emphasizing the need for regulatory support and strategic organizational commitment. Future research should empirically validate the proposed framework through longitudinal studies, cross-industry comparisons, and qualitative investigations into employee and managerial perspectives. By embedding sustainability principles into OSH training programs, organizations can enhance employee engagement, improve compliance with sustainability standards, and foster long-term resilience. This research contributes to the growing literature on workplace sustainability by integrating safety training into broader environmental, social, and governance (ESG) strategies, offering insights for both academia and industry.

Keywords: Occupational Safety and Health (OSH), sustainability, workplace safety, employee behaviour, organizational policies

INTRODUCTION

Occupational Safety and Health (OSH) is paramount important in shaping safe, ethical, and productive work environments. The focuses are more into preventing workplace injuries, illnesses, and fatalities not only to ensures compliance with legal and regulatory standards but also contributes to operational continuity and employee well-being (ILO, 2022). As work environments continue to evolve in response to digitalisation, demographic shifts, and post-pandemic recovery, the need to embed safety into the core of organisational culture has become more urgent (Firmanshah et al., 2024). At the same time, sustainability has emerged as a central concern for organisations striving to align their operations with broader environmental, social, and economic goals. This includes commitments to responsible resource use, equitable labour practices, and long-term value creation, principles aligned with frameworks such as the United Nations Sustainable Development Goals (SDGs) (United Nations, 2015; Elkington, 2018).

Although both OSH and sustainability are well-established supports of responsible management, they are often treated as separate domains in research and practice. The disconnect between these two areas is evident in most organisational policies and academic literature, where OSH is hardly framed within compliance and risk management, while sustainability is approached from a broader corporate social responsibility (CSR) lens (Zanko & Dawson, 2012; Jabbour et al., 2013). This fragmented approach limits the potential to connect OSH training as a mechanism not only for improving workplace safety, but also for promoting sustainable behaviours, resource efficiency, and long-term organisational resilience.

By its nature, the construction and manufacturing industries operate in high-risk settings where the safety of workers and the health of the environment are continuously at stake. More than just suffering from accidents at work, these sectors also deal with immense pollution and reduction of resources (Kineber er et al., 2023). It is in these sectors where the potential impact of combining OSH training with sustainability techniques will makes a real difference.

In practice, this combination will equip employees not only the knowledge and skills to stay safe, but also the sense of responsibility to conserve recourses and maintain the environment. For example, employees who have OSH training and an understanding of sustainable practice will be more likely to identify the hazards, know-how to reduce wastages, utilize energy-saving methods, and shall contribute towards environmentally friendly changes in operations. These actions can pile up and create a more ethical and stronger workplace culture.

Apart from the operational benefits, aligning OSH training with sustainability principles will also make the workers feel more engaged and valued. When workers feel that their organisations care about their well-being and the world they are a part of, it will create a greater sense of loyalty and moral commitment. It will also promote not just compliance but a workplace culture that embraces safety, social responsibility, and environmental care as part of the daily work. Despite these positive findings, there remains limited evidence showing how such integrated training programs actually impact behavior and organizational culture, especially in high-consequence fields like manufacturing and construction. This small scale of research necessitates the need to examine the potential more rigorously.

The issue is the absence of comprehensive models explaining how OSH training and workplace sustainability culture are interconnected. While growing attention has been paid to both subjects, limited research has addressed their intersection, which is on how safety training interventions can influence generalised organisational values towards sustainability (Sousa et al., 2014). In addition, there is limited agreement regarding the mechanisms by which OSH training will have sustainability effects, whether it increased employee awareness, leadership, or policy-based. Therefore, closing that gap is important to researchers and practitioners alike seeking more integrated approaches to workforce development and corporate responsibility.

The current study is significant because it connects two significant areas in the workplace which is the Occupational Safety and Health (OSH) training and the sustainability culture. While both have been studied separately, there is still little research on how they influence each other. Academically, this study builds on existing theories such as the Social Learning Theory (Bandura, 1977) and Institutional Theory (DiMaggio & Powell, 1983), where it illustrates how safety training can also drive sustainable practices within organisations. This adds a new perspective to how training programmes can help support long-term environmental, social, and economic goals in the workplace.

Theoretical framework proposed within this study clearly identifies the main factors present. They are the principal variables, such as the sustainability culture and OSH training, and determinants of how they interact with one another. For example, the organisational commitment, leadership support, behaviour change, and employee awareness. By binding all these ideas together, the framework presents a clear-cut framework to which future studies can adhere in order to test how the relationships bear out within different contexts. It also enables scholarly argumentation by assisting in closing the knowledge gap of how safety and sustainability can be integrated in a successful, meaningful way (Kavouras et al., 2022; Zwetsloot et al., 2013).

Practically, this study offers useful guidance to companies, especially in high-risk business activities such as manufacturing and building construction. With waste minimization, energy efficiency, and social responsibility discussions included in OSH training, organisations can maximize worker protection while encouraging sustainable practices at the same time (ILO, 2019; Schaltegger et al., 2016). This approach also helps with global objectives like the United Nations Sustainable Development Goals (SDGs), SDG 3 (Health and Well-being), SDG 8 (Decent Work and Economic Growth), and SDG 12 (Responsible Consumption and Production).

This research also offers practical advice to policymakers on how to incorporate Occupational Safety and Health (OSH) training and sustainability goals at the workplace. Instead of perceiving safety and sustainability as competing challenges, the research demonstrates how they can support each other. According to the conceptual model in this research, policymakers can set rules and regulations which will help organisations to include environmental, social, and governance (ESG) values in their OSH training (Kavouras et al., 2022).

Governments and regulatory bodies can also introduce incentive programs that would encourage organizations especially small and medium enterprises (SMEs), to adopt such holistic practices. SMEs might not be able to afford the financial and human resources required to develop these programs on their own. Therefore, providing financial support such as training grants, tax relief, or subsidies tied to sustainability would be more effective (Reis et al., 2020). While, in turn, certification schemes that are founded on global standards like ISO 45001 for safety in the workplace and ISO 14001 for environmental management can provide companies with a measure to approach and assurance (International Organization for Standardization [ISO], 2018).

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Besides monetary incentives, governments can also form partnerships with private institutions to improve the way training is carried out, swap expert views, and stimulate best practice sharing among different industries. Such partnerships would likely boost SME capacity and responsiveness to safety as well as sustainability demands. As noted by Elkington (2018), policies that follow to the Triple Bottom Line approach of being economically, environmentally, and socially balanced, may give rise to workplaces that not only become safer but also more sustainable in the process. This study will provide an assistance in the formulation of such policies and help countries achieve their national sustainability goals as well as their global commitments like the United Nations Sustainable Development Goals (SDGs).

Overall, this research will make an important contribution by the combination of practice and theory. It offers researchers a fresh outlook on OSH training and offers firms and policymakers a clear path towards making workplaces safer and more sustainable. By highlighting safety and sustainability as having much in common, the study builds up a more holistic approach to workplace development.

LITERATURE REVIEW

OCCUPATIONAL SAFETY AND HEALTH

Occupational Safety and Health (OSH) dynamically providing secure and healthy work environments across various industries. It involves a systematic approach to identifying, assessing, and controlling workplace hazards through procedures, policies, and safety management systems (Zanko & Dawson, 2012; Goetsch, 2019). Apart from compliance with the law, OSH also ensures long-term stability and performance of organisations by way of increased employee well-being, reduced work interruptions, and enhanced productivity (Safe Work Australia, 2020; Kongtip et al., 2008). Strong culture of OSH where safety is integrated into everyday work decisions has been associated with fewer accidents and better performance outcomes (Clarke, 2013; Lingard & Rowlinson, 2005).

Training is a key element of any effective OSH plan in any field. It will assist the employees develop skills to recognize hazards, take proactive actions, and respond during emergency situations (Robson et al., 2007). Effective training programs normally will involve training in risk assessment, emergency response, and the creation of a generalized safety culture. Vinodkumar and Bhasi (2009) determined that management support, communication, and participative employee involvement are significant to the success of such programmes. Nonetheless, in small and medium-sized enterprises (SMEs), Hasle and Zwetsloot (2011) showed that having limited resources and lacking managerial involvement can reduce the effectiveness of OSH training. In spite of these hindrances, the long-term benefit in the way of enhanced safety compliance and enhanced worker motivation could justify the cost of OSH training.

In addition, use of participative and contextual training approaches has been found to improve learning outcomes and behavioral change related to safety knowingly (Burke et al., 2006). Experiential training methods and participative training techniques, such as simulation and scenario training, can train employees more effectively to recall crucial information (Colligan & Cohen, 2004). These strategies not only improve the on-the-spot understanding of safety protocols but also promote deeper understanding of how safety and sustainability goals can be achieved

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simultaneously. Therefore, embracing innovative training designs can strengthen both safety performance and dedication to sustainable work culture.

WORKPLACE SUSTAINABILITY

Sustainability at work is about implementing environmental, social, and economic goals in the way organisations are managed (Benn et al., 2018). It is not just to meet the law, however, but to support long-term business success and being responsible to the world and society. It is also involved in minimising waste and emissions, and conducting businesses in a responsible financially manner.

Besides, the adoption of sustainability in organizational practices supports innovation, resilience, and adaptability in dealing with global issues such as climate change and resource availability. Organizations that embrace sustainability-oriented strategies, Lozano (2015) discusses, show enhanced performance in stakeholder engagement, reputation, and long-term profitability. Adding to this, the connection of sustainable principles in workplace culture can directly influence employee motivation, retention, and productivity (Glavas, 2016). When employees believe that their organisation is committed to greater social causes, they will surely be more engaged and shift those values into work practices.

Ecologically, sustainable workspaces accept practices such as using less energy, reducing waste, and choosing environmentally friendly materials (Schaltegger et al., 2016). These practices not only will minimize a company's environmental impact but also mitigate climate change-related risks and regulatory risks (Bocken et al., 2014). Socially, the focus is on fair wages, workplace diversity, employees' well-being, and contributing to the society within which they work (Hahn et al., 2018). Promoting social sustainability creates a more just and inclusive work culture, from which organisational reputation and recruitment can gain (Aguinis & Glavas, 2012). Additionally, as companies get involved in community engagement and employee well-being, they promote stakeholder relations and build social capital that supports resilience in the long term (Branco & Rodrigues, 2006).

Conversely, for financial sustainability, it is achieved through cost-effectiveness in operations, long-term perspective, and ethical decision-making (Dyllick & Muff, 2016). Sustainable financial management typically involves reduced use of resources, investment in energy-efficient technology, and supply chain transparency (Epstein & Buhovac, 2014). These do not only go to enhance efficiency in operations but also enhance risk management as well as sustained investor confidence, facilitating business for sustainability.

In addition, workplace sustainability practices have also been discovered to support organisational competitiveness and innovation. For Nidumolu, Prahalad, and Rangaswami (2009), sustainability pursuit could lead to process innovation, new business models, and new market prospects. Companies that incorporate sustainability into their strategies are better suited to manage risks, respond to changing regulatory landscapes, and attract investment (Eccles, Ioannou, & Serafeim, 2014). These results show that sustainability is not only an environmental or ethical matter but also a strategic necessity that promotes business resilience and long-term value creation.

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Amongst the barriers to workplace sustainability is the lack of effective definitions and measurement structures, where it cannot be measured or compared the outcomes (Montiel & Delgado-Ceballos, 2014). Yet, structures like the United Nations Sustainable Development Goals (SDGs) and the ISO 26000 social responsibility standard help organisations align their practices with globally applicable standards.

In addition, the dynamic and ever-changing nature of sustainability expectations often creates certain doubt for organizations who want to implement measurable and standardized structures of sustainability. According to Searcy (2012), many organizations struggle to create meaningful and adaptive key performance indicators in different operating contexts. Further, the rise of reporting frameworks, such as the Global Reporting Initiative (GRI) and the Sustainability Accounting Standards Board (SASB), though useful, can create confusion regarding what metrics are most appropriate (Eccles & Krzus, 2018). This emphasizes the need for harmonized, industry guidelines that balance global hopes with practical, local action strategies.

THE INTERSECTION OF OSH AND SUSTAINABILITY

The connection of Occupational Safety and Health (OSH) and sustainability is a priority research field, since both concepts share the same goals of improving well-being, reducing risks, and ensuring long-term sustainability. OSH actions have significant synergies with the United Nations Sustainable Development Goals (SDGs), namely Goal 3 (Good Health and Well-being), Goal 8 (Decent Work and Economic Growth), and Goal 12 (Responsible Consumption and Production). Kovauras et al., (2022) stated that the integration of OSH into sustainability agendas is essential to reach these global ambitions because safe and healthy work is at the heart of sustainable development. OSH action, for instance, that reduces work-related injuries and illnesses makes a direct contribution to improved health outcomes (SDG 3) and enhances productivity, thereby promoting economic growth (SDG 8). Furthermore, sustainable OSH practices, such as waste reduction and optimization of resource use, align with responsible consumption and production (SDG 12), demonstrating the compatibility of OSH and sustainability.

Theoretical links between safety, health, and sustainability also emphasize the interconnectedness of these areas. Zwetsloot and Leka (2010) argue that a strong safety culture, which prioritizes worker well-being and risk prevention, is a foundation of sustainable organizational practices. They stress that organizations with well-developed OSH systems are better able to address general sustainability challenges as such systems foster resilience, innovation, and stakeholder trust. Initially, Zwetsloot et al., (2013) view basic values of prevention, participation, and continuous improvement as being central to the integration of OSH and sustainability. These values support not only workplace safety but also environmental and social responsibility, building an integrated organizational management approach.

Mohamad et al., (2014) propose that Occupational Safety and Health (OSH) Management Systems (OHSMS) can serve as an interface between sustainability and safety. They argue that OHSMS, when designed according to sustainability principles, can address various aspects of sustainability simultaneously. For example, an OHSMS that adopts energy efficiency not only reduces workplace hazards but also reduces environmental impact. This dual focus on safety and sustainability enables organizations to achieve compliance with regulatory expectations while underpinning overall sustainability goals. The authors also emphasize that the requirement for the participation of workers in this effort, since inclusive approaches to OSH management can drive innovation and foster a culture of sustainability.

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Cognitive and behavioural matters also have a significant role to play in the intersection of OSH and sustainability. Goh and Sa'adon (2015) examine how cognitive processes such as risk perception and decision-making influence safety behavior in high-risk environments. Their study provides evidence that training programs aimed at improving cognitive skills can result in enhancing safety performance as well as sustainability practices. For instance, employees trained to identify and reduce risks are more likely to adopt sustainable behaviors such as reducing waste or conserving energy. Thisfindings disclose that the potential of OSH training to impact sustainability by changing the attitudes and behaviours of employees.

Therefore, the convergence of OSH and sustainability is characterized by shared goals, intellectual interlinkages, and practical complementarity. OSH activities naturally relate to the SDGs through the instigation of health, economic growth, and sustainable consumption. Intellectual strategies emphasize the culture of safety, principal values, and management systems in bringing OSH together with sustainability, whereas cognitive and behavioural procedures indicate the central role of employee involvement and training. Through these connections, organizations can generate workplaces that are not only safe and healthy but also socially and environmentally sustainable. This integrated approach is important to achieving long-term organizational resilience as well as towards international approaches towards sustainability.

EXISTING RESEARCH ON OSH TRAINING AND SUSTAINABILITY

While the majority of studies are on either OSH or sustainability, joint studies on the two, especially through training, are in their early stage. Abad et al. (2013), for example, studied how OHSAS 18001 certification improves safety performance but commented on the lack of focus on how it also impacts sustainability. Similarly, Fernández-Muñiz et al. (2014) examined the influence of leadership on OSH outcomes but did not explore on how leadership could correlate safety efforts with sustainability goals.

The COVID-19 pandemic brought new risks and challenges. Nomani (2022) pointed out that safety training had to quickly adapt to deal with infectious diseases, but there's limited research on how these changes also support sustainability, for example, by improving public health or workplace flexibility.

Research on SMEs shows the added difficulty of implementing sustainable OSH practices. Nielsen et al. (2015) suggested that integrated approaches merging training and organisational development are more effective, though many SMEs lack the resources to do this. Zohar (2014), who focused on the concept of safety climate, found that employee perceptions greatly influence safety behaviour. However, the connection between this climate and broader sustainability outcomes remains underdeveloped in current research.

The literature shows that OSH and sustainability share common values and goals, such as promoting health, reducing risk, and supporting long-term success. However, the majority of studies still identify them as separate issues. There is little evidence showing the possibility of OSH training in advancing sustainability, especially in high-hazard sectors like construction and production or in small enterprises with limited capability. This indicates a direct knowledge gap on how OSH training could be planned more strategically in order to fulfill both safety and sustainability targets. Filling this gap is the concern of the present study, which suggests further to develop a conceptual model that combines OSH training and sustainable workplace practices in an applicable, real-world form.

In short, existing literature about OSH training has primarily focused on the impact of OSH training on safety performance and less on its sustainability-augmenting attributes. Some of the main knowledge gaps in the literature include the lack of integrating OSH management systems with sustainability objectives, leadership's contribution to developing sustainable OSH culture, interlinking OSH training with changing risk, and the challenges that the adoption of sustainable OSH programs by SMEs imposes. Closing these gaps is important to developing a holistic picture of how OSH training can contribute to workplace sustainability and to being in a position to provide helpful insights for organizations that want to achieve dual objectives of safety and sustainability.

THEORETICAL FRAMEWORK

This study uses a theoretical framework which scientifically explains on the relationship between Occupational Safety and Health (OSH) training and the development of workplace sustainability culture. As critically explained in the Literature Review, OSH training does not merely promote short-term compliance with safety but also has the potential to affect long-term values, attitudes, and behavior in line with sustainability objectives. In this context, OSH training is seen as a preventive and transformative intervention impacting organisational and individual approaches to environmental stewardship, social justice, and economic sustainability.

It is founded upon the Triple Bottom Line (TBL) model principles (Elkington, 2018) illustrated below in Figure 1 that introduces economic, environmental, and social goals into organisational decision-making. This model is a stepping stone to an understanding of how organisations can accommodate profitability and sustainability. In this regard, training on OSH is not an isolated activity but an integrated system that connects employees' safety (social aspect), proper utilisation of resources (economic aspect), and protection activities for the environment (environmental aspect). It encourages organisations to think broader when it comes to training, seeing it as a stimulus for strategy-driven sustainability programmes.

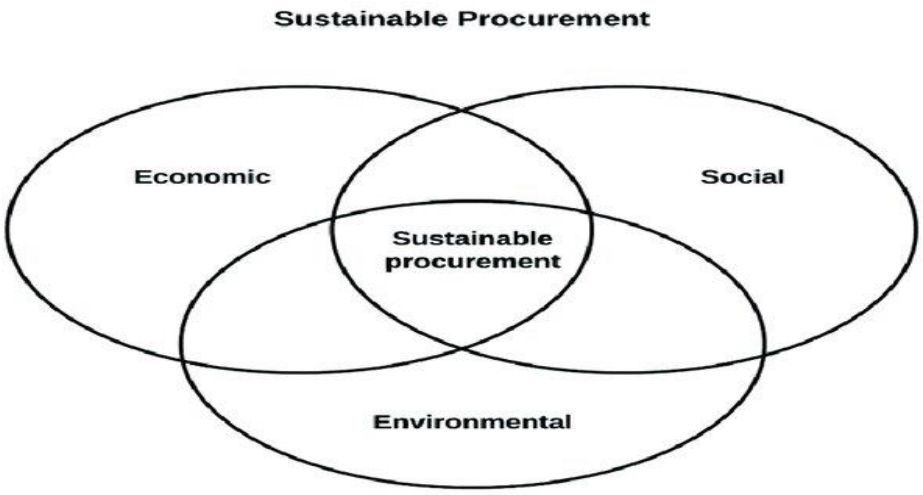


Figure 1:Triple Bottom Line of Sustainability (Source: Elkington, 1997).

Moreover, the model borrows from ADDIE (Analyse, Design, Develop, Implement, Evaluate), occupational health theory, wherein it emphasizes the significance of safe working environments for long-term employee well-being and health (Goetsch, 2019). It further incorporates organisational behaviour theories in the form of learning, motivation, and organisational culture change (Burke et al., 2006). These theories allow all employees to understand how OSH training is converted into action that leads to sustainability, such as anticipatory hazard reporting, energy-saving action, and ethical workplace behavior. All of these strands of theory combined provide a strong foundation upon which to explore how traditional OSH interventions may influence sustainability-related outcomes across different organisational levels.

METHOD

This study employs a conceptual research design in exploring the connection between Occupational Safety and Health (OSH) training and developing a culture of sustainability in an organization. With the remarks that this study is still developing and has no traditional models, a conceptual paper is appropriate to report and consolidate existing literature from a number of disciplines (Gilson & Goldberg, 2015; Jaakkola, 2020). This methodology helps in the identification of key concepts, outlines how concepts relate to each other, and builds a framework based on occupational safety literature, organisational behaviour, and sustainability studies literature.

The methodology follows four main steps as shown in Figure 2 below: (1) defining the key variables and concepts, (2) choosing relevant theories to guide the discussion, (3) reviewing literature to support the proposed connections, and (4) presenting a model that includes both mediators and moderators. Although no primary data is collected in this paper, a thorough review of journal articles and research studies helps create a strong and structured model.

KEY CONCEPTS AND VARIABLES

Referring to Table 1 below, the independent variable is OSH training, which refers to both formal and informal efforts to teach the employees on how to identify hazards, manage the risks, and work in safe conditions (Robson et al., 2007). The dependent variable is sustainability culture, defined as the shared values and behaviours in an organisation that support environmental care, social responsibility, and economic sustainability (Lozano, 2015).

Mediating Variables include employee awareness, changes in behaviour, and updates in internal policies. These variables explain how OSH training can influence a sustainability culture. Social Learning Theory (Bandura, 1977) supports this idea by showing how people learn behaviours through observation, repetition, and feedback.

Moderating Variables include factors like how committed an organisation is to sustainability, how much leadership supports the initiative, and how external rules and policies affect the organisation. Institutional Theory (DiMaggio & Powell, 1983) explains that external expectations can push organisations to improve and adopt better safety and sustainability practices.

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Table 1. Conceptual Framework Table

Component	Description	Relationship
Independent Variable	OSH Training	The primary input that influences workplace sustainability culture.
Mediating Factors	Employee Awareness	OSH training increases employee knowledge of safety and sustainability practices.
	Behavioural Change	Employees adopt sustainable and safe behaviours as a result of OSH training.
	Organizational Policies	Organizations implement policies that integrate OSH and sustainability goals.
Moderating Factors	Organizational Commitment	The level of dedication an organization has to sustainability influences outcomes.
	Leadership Support	Leadership plays a key role in promoting OSH and sustainability initiatives.
	Regulatory Environment	External regulations shape how OSH and sustainability practices are implemented.
Dependent Variable	Workplace Sustainability Culture	The outcome: a workplace culture that prioritizes environmental, social, and economic sustainability.

DATA SOURCES AND MEASURES

Although this is a theoretical study, it suggests sources that future researchers can use to measure the concepts. OSH training measures can be adapted from Vinodkumar and Bhasi (2009), who assess aspects such as leadership support, communication, and the quality of training. To measure sustainability culture, future studies could use indicators from Glavas (2016) and Montiel and Delgado-Ceballos (2014), which cover areas like environmental action, social responsibility, and ethical leadership. For behavioural changes and organisational commitment, tools like Zohar's (2014) safety behaviour scale and the OCQ by Meyer and Allen (1991) could be useful.

DESIGNING THE FRAMEWORK

The process of building the framework includes:

1. Reviewing past research in OSH, sustainability, and organisational behaviour.
2. Organising the key variables (independent, dependent, mediators, and moderators).
3. Applying Social Learning Theory and Institutional Theory to guide the structure.
4. Designing a model that shows how these variables are linked.

A visual flowchart will be included to show how the ideas are connected and how theory and literature were used to build the framework.

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CONTRIBUTION TO RESEARCH AND PRACTICE

This conceptual paper does not involve new data collection; however, it places the groundwork for how data can be gathered and applied in future research. The proposed model is a tangible and testable framework that researchers can examine through quantitative surveys, qualitative interviews, or a combination of the two. Specific items for measuring variables such as OSH training effectiveness, employees' awareness, and sustainability culture can be borrowed from established instruments such as those developed by Vinodkumar and Bhasi (2009), Glavas (2016), and Meyer and Allen (1991). These tools offer relevance and validity in both sustainability and workplace safety contexts. This framework not only helps to clarify what needs to be measured but also offers suggestion of clear paths for how future data can validate the relationships predicted in the model. Moreover, it also provides practical suggestions for employers to integrate sustainability components into their training programs and policymakers who want to promote integrated strategies for occupational safety and environmental responsibility.

Subsequent research can utilize this conceptual model as a foundation for formulating empirical investigations grounded on quantitative, qualitative, or mixed-methods designs. Questionnaires can be designed to quantitatively assess variables such as the level of exposure to OSH training, the level of employee participation in sustainable practices, and organisational sustainability culture perceptions. Focus group discussions or in-depth interviews could provide more insight into participants' perceptions and application of safety and sustainability concepts in their daily work activities using qualitative methods. Mixed-methods designs would allow for triangulation and more detailed validation of findings, offering a balanced perspective between generalisability and context-specificity. Longitudinal studies would also be worth exploring in examining how the effects of OSH training evolve over time, shedding light on whether behavioural and cultural shifts towards sustainability are sustained or weaken. These types of studies can record the dynamic process of organizational change and can guide continuous improvement of OSH and sustainability interventions.

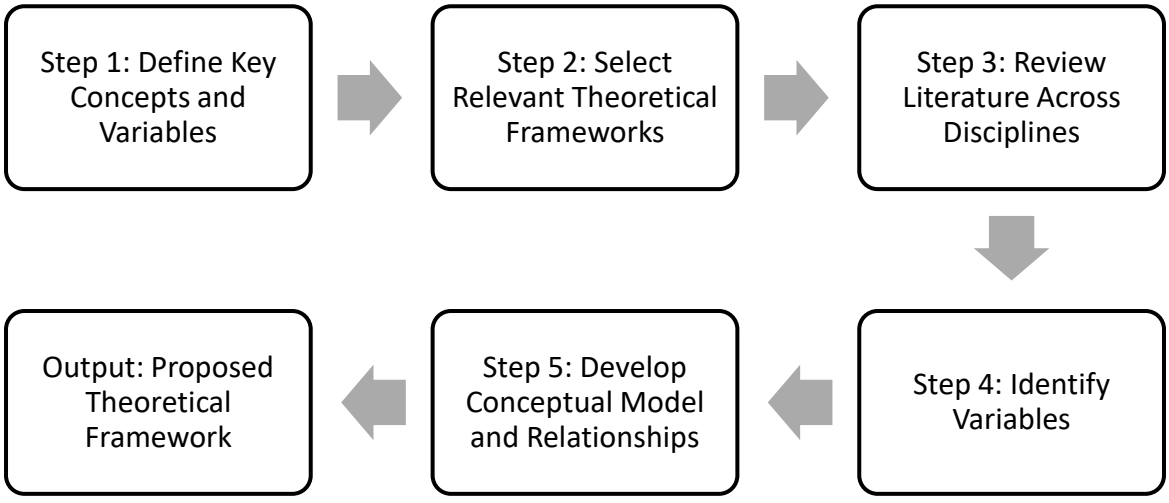


Figure 2. Methodological Flowchart

RESEARCH DESIGN

OSH workplace culture and sustainability training is a new area of research that having less well-established theoretical foundation. A conceptual paper with an ideal concept is employed to survey and synthesize existing literature to present novel theoretical contributions (Gilson & Goldberg, 2015). It comes in handy for the identification of moderating factors, mediating process, and critical variables influencing the relationship.

The subject of inquiry interconnects a number of disciplines, including occupational safety, organizational behavior, and sustainability studies. A conceptual paper approach allows for the intersection of the various disciplines to offer a common paradigm (Jaakkola, 2020). By reconciling available empirical evidence and theory, the paper is able to overcome theoretical gaps in the literature and propose a universal model.

The primary aim of the current research is to develop a theoretical model that explains how OSH training affects workplace sustainability culture. It is accepted that conceptual papers are most appropriate for theory development by proposing new constructs, models, and relationships (MacInnis, 2011). By this, the researchers will leave space for the recognition of gaps in research and the formulation of hypotheses to be tested in future empirical researches.

Therefore, the conceptual paper finds its application in the real world through the delivery of actionable suggestions to organizations. Through the recommendation of a framework that connects OSH training to sustainability outcomes, this research will eventually assist organizations to create training programs that are aligned with sustainability goals (Whetten, 1989). This is besides ensuring that the research is theoretically rigorous but also practically applicable.

DATA COLLECTION

The first task of the analytical framework is to identify and define the important variables. The independent variable is OSH Training, which includes initiatives and programs on improving workplace health and safety. The dependent variable is Workplace Sustainability Culture, which is the integration of environmental, social, and economic sustainability values into organizational practices. In addition, the model differentiates mediating variables (e.g., employee awareness, behavioral change, and organizational policies) and moderating variables (e.g., organizational commitment, leadership support, and regulatory environment) influencing the relationship between OSH training and sustainability culture.

The framework for analysis rests on a systematic review of available literature to derive the theoretical foundation of the study. This will involves reviewing the studies on OSH training, workplace sustainability, and where they correlate. Through the integration of findings across multiple disciplines, the framework identifies gaps in the literature and proposes new theoretical links. As an example, the framework uses theories such as Social Learning Theory (Bandura, 1977) to illustrate how OSH training influences employee behavior and Institutional Theory (DiMaggio & Powell, 1983) to examine the impact of external regulation on organizational practice.

From the literature synthesis, the framework of analysis proposes a conceptual model describing how the interactions between the critical variables function. The model positions OSH training as the core variable influencing workplace sustainability culture, while mediating factors (including employee awareness, change in behaviour, and organisational policies) explain the mechanism

by which this interaction functions. Moderating variables (e.g., leadership support, organizational commitment, and regulatory environment) are included to allow for contextual factors that may strengthen or weaken the relationship. The model is the foundation upon which testable hypotheses and future empirical research may be developed.

The model emphasizes the importance of examining mediating and moderating processes to adequately value the relationship between OSH training and sustainability culture in the workplace. Mediating processes explain how OSH training leads to sustainability results, e.g., through increased employee awareness about safety and sustainability behavior or adoption of sustainable action. Moderating mechanisms describe contextual factors influencing the strength or character of the relationship, i.e., organizational commitment to sustainability or the level of leadership support for OSH programs. The integration of these mechanisms within the framework offers a richer picture of the complicated relationship between OSH training and sustainability culture.

The analytical framework not only offers theoretical insight but also offers practical implications for organizations. By defining the most significant factors contributing to OSH training success, such as achieving sustainability, the framework is then in a position to provide pragmatic recommendations concerning planning and deployment of training programs. For example, organizations can use the framework to develop modules of training encompassing the principles of sustainability, develop sustainability-oriented OSH policies, and promote commitment from leadership to combined safety and sustainability programs. Hence, the framework highlights the influence of regulatory contexts on organizational practice and offers guidance for policymakers who wish to promote workplace sustainability.

Lastly, the analysis framework suggests the directions for future research such as empirical testing of the proposed model, cross-cultural studies to establish the generalizability of the framework, and longitudinal studies to examine the long-term impact of OSH training on the sustainability culture. By providing a distinct map of future research, the framework shall ensures that the research will be making useful contributions towards the cumulative advancement of knowledge within this field.

The analytical framework presents a structured and systematic approach to examining the relationship between OSH training and work environment sustainability culture. Through the establishment of main variables, incorporation of existing research, development of a conceptual model, and examination of mediating and moderating mechanisms, the framework presents an overall view of this complex relationship. Not only does it build theoretical knowledge, but it also borrows practical lessons for organizations and policymakers, thus contributing an added value to the disciplines of occupational safety, organizational behavior, and sustainability.

EXPECTED FINDINGS

This theoretical article foresees that Occupational Safety and Health (OSH) training is a key factor in establishing a firm sustainability culture within organisations. Whilst traditionally viewed as means for reducing workplace accidents and complying with regulations, OSH training is increasingly becoming known among stakeholders as a strategic tool for inculcating wider organisational values, including environmental stewardship, social responsibility, and ethical business practices. The model in question considers the fact that if OSH training is well designed to include sustainability aspects, then it has the potential to impact the attitudes and practices of employees

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greatly. They would also include more sensitivity to environmental concerns such as energy use and waste disposal, support for inclusive workplace policies and ethics, and compliance with ethical decision-making. By preparing the employees with both the knowledge and motivation to act responsibly, OSH training becomes more than a compliance mechanism. It will be seen as a transformative driver that relates everyday operational safety to long-term sustainability objectives. Thus, the study positions OSH training as a foundational element for aligning safety practices with sustainability goals at both individual and organisational levels.

One of the key expectations is that OSH training will enhance employees' awareness of sustainability issues relevant to their roles and responsibilities in the workplace. The framework would suggest that learning in a social context through observation, interaction, and reinforcement would enables employees to internalise sustainability values. Hence, when OSH training includes modules on topics such as energy conservation, responsible waste disposal, and ethical labour practices, the employees are more likely to develop their personal sense of accountability for sustainability-related behaviours. This awareness not only shapes their individual conduct but also influences group norms as employees model these behaviours for peers.

Another important finding anticipated by the framework is that employee engagement will serve as a critical mechanism through which OSH training fosters sustainability culture, which refers to the active participation, emotional commitment, and behavioural investment of employees in sustainability initiatives promoted through training. When employees are involved in the learning process and understand how their actions contribute to broader environmental and social goals, they are more likely to take ownership of those initiatives. This includes participating in workplace recycling programmes, energy conservation efforts, sustainable procurement, and community outreach. The framework suggests that such engagement transforms OSH training from a one-way dissemination of information into an interactive process that shapes workplace norms and values. Those engaged employees will become role models, motivating others and sustaining a cycle of continuous improvement in both safety and sustainability practices. Therefore, the success of OSH training is not solely determined by the content delivered, but by the extent to which it empowers employees to take initiative and lead sustainability efforts at the grassroots level.

At the organisational level, the model highlights that leadership support and a strong commitment to sustainability are critical enablers of effective OSH training outcomes. Organisations that integrate sustainability into their core strategic objectives and allocate dedicated resources such as time, funding, and personnel, are more likely to experience tangible changes in workplace behaviour and culture. Leadership plays a key role in modelling values, setting expectations, and creating an environment that encourages employees to take ownership of both safety and sustainability goals. This alignment between leadership vision and operational practice enhances the credibility and effectiveness of OSH training interventions. Drawing on Institutional Theory (DiMaggio & Powell, 1983), the framework suggests that internal governance structures, along with external pressures such as industry regulations and stakeholder expectations, shape how organisations prioritise and implement integrated safety-sustainability initiatives. In settings where sustainability is embraced not just rhetorically but structurally, OSH training becomes a lever for embedding long-term, system-wide cultural change.

The framework also expects that once a sustainability-oriented culture is implanted through consistent and well-structured OSH training, surely the organisation will experience ongoing and mutually reinforcing improvements in safety management, resource efficiency, and employee well-being. These continuous improvements are not isolated efforts but interconnected outcomes where gains in one area positively influence others. Over time, this cyclical reinforcement

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contributes to the creation of a high-functioning, adaptive organisation capable of responding effectively to internal and external challenges. As a result, such organisations are likely to gain greater credibility and trust among their stakeholders, including employees, clients, regulators, and the broader community.

In general, the anticipated outcomes of this conceptual framework indicate the change-enabling capacity of OSH training for organisational sustainability. By increasing employee awareness, promoting active participation, and bringing about sustained behaviour change, it is expected that OSH training will facilitates the inserting of sustainability values into the day-to-day operation and organisational culture. This synthesised framework connects previously separate domains of safety management and sustainability, showing one to enable the other. By empirical testing, these hypotheses could later produce valuable insight feeding into theory development in organisational studies and knowledge to inform evidence-based practice in the design of training. Organisations will stand to gain from the findings by employing them to create training programmes that are not merely regulatory compliance but strategic leverage for engendering long-term sustainable performance. In academic settings, the model can serve as a foundation for possible future empirical studies aiming to verify the mechanisms through which safety practices impact sustainability performance.

DISCUSSION

It is seen that Occupational Safety and Health (OSH) could be a central role in achieving a workplace safety as well as sustainable culture. With well-organized and proper designed training activities, employees acquire the needed knowledge and ability to identify various hazards in the workplace, apply pertinent safety practices, and implement risk management procedures that are effective (Mohamad et al., 2014). These competencies are not just valuable in terms of reducing incidents and injuries at the workplace, but also to general organisational goals that include regulatory compliance, effective operation, and improved staff morale. When workers are safe and well-versed, their productivity will generally increase, and organisations can then provide a secure, legally compliant, and proactive working environment.

In addition to reinforcing safety, OSH training can also serve as a catch-all vehicle for integrating sustainability into organisational levels. By inserting such discussion topics as energy conservation, material efficiency, pollution prevention, and appropriate waste management into courses of safety training, organisations can possibly help staff learn how their daily activities affect the environment (Reis et al., 2020). This integrated approach will allow the incorporation of functional skills and fosters an attitude that prioritizes safety and environmental stewardship. Once employees have a greater understanding of the environmental consequences of unsafe or inefficient practices, they will be more inclined to adopt ecologically favorable behaviors such as waste conservation, the reporting of environmentally perilous conditions, and participation in green activities. With the passage of time, these actions create a collective organisational culture where sustainability becomes a working norm and not a theory.

Sustainable integration into OSH training makes workers even more dedicated to green practices. By freely discussing the environmental consequences of routine workplace actions such as energy consumption, waste generation, and material usage, training programmes may promote awareness and have a greater sense of accountability among employees (Zwetsloot et al., 2017). When workers understand that simple behavioural adjustments, like switching off idle equipment or recycling trash, can collectively reduce the organisation's environmental footprint, they are

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likely to embrace sustainable behaviour. Eventually, such training not only inculcates individual responsibility but also shared responsibility for sustainability performance, which results in organisational-level behavioural change and measurable improvements in sustainability performance.

From a management perspective, the integration of corporate sustainability with OSH training enhances are not only a corporate social responsibility (CSR) but also an organisational flexibility and adaptability in the long term. The integration indicates a deep commitment to ethical operations and reinforces an organisation's overall strategic imperatives. Organisations that formally incorporate issues of sustainability into safety training evolve a workforce that is not only safety conscious but also socially and environmentally aware. This approach shall strengthen the internal stakeholder morale and external stakeholder confidence. It has a close association with Elkington's (2018) Triple Bottom Line framework, which calls for the integration of profit-making with social equity and environmental sustainability. In addition, this integration helps in managing stakeholder expectations, following environmental compliance, and achieving sustainability certifications, which positions the organisation as a responsible and visionary organisation.

The common interest in safety and sustainability has particular importance for high-risk sectors such as manufacturing, construction, and energy. This is where occupational risks and environmental impacts tend to be both significant. Workplace operations in these industries frequently involve heavy machinery, hazardous materials, and processes that contribute to pollution and resource depletion. Through incorporating principles of sustainability into OSH initiatives, organisations are therefore capable of minimising health and safety risks while simultaneously alleviating environmental concerns. For example, safety training that includes energy conservation steps, chemical use protocols, and eco-friendly disposal methods will allow employees to act in ways that are both safe and environmentally friendly. Such integration not only helps create working environments that are safer and more sustainable but also supports organisational responsibility and credibility with key stakeholders, including regulatory agencies, investors, customers, and the public at large. By showing a commitment to safe and sustainable practices, companies in these industries can improve compliance, reduce reputational risk, and align more closely with national and global sustainability goals.

In general, OSH training with a sustainability component brings a multi-benefit to an Organisation. It does not only increase the short-term safety outcomes, but it also constructs an Organisation's work culture on the basis of long-term social and environmental stewardship. By equipping employees with the knowledge necessary to make decisions that are sustainable, such training promotes daily behavior in synchronization with sustainability goals, including reduced wastage of resources, promotion of energy conservation, and sensitization regarding the broader impacts of their actions on people and the environment. This will generate a sense of ownership and self-empowerment among employees, leading to a more collaborative and engaged workforce that can contribute significantly towards an organisation's sustainability performance as well as ethical credibility.

CHALLENGES AND BARRIERS

Despite having the potential to contribute to its advantages, the integration of OSH training with sustainability activities is faced with various challenges and hindrances. One of them is restricted organizational commitment, whereby companies view OSH training as a mere compliance initiative and not as a strategic initiative that contributes to sustainability (Hasle & Zwetsloot, 2011).

Without leadership support, sustainability-focused OSH training does not get adequate resources and institutional support to promote realistic change.

Another issue arises is the resistance to change among employees and the management. Employees may resist new habits or practices, especially if they perceive that working for sustainability adds to their workload (Kongtip et al., 2008). To overcome this obstacle, there is a need for a shift in organizational culture where sustainability is integrated into day-to-day activities using incentives, employee engagement schemes, and continuous training.

Moreover, constrained resources are the greatest impediment to the integration of OSH training with sustainability. Small and medium-sized enterprises (SMEs) may lack on the technical and financial capacity to develop comprehensive training packages that incorporate sustainability elements (Nielsen et al., 2015). Therefore, to mitigate this, organizations can employ the vehicle of collaboration between regulatory bodies, industry associations, and academic institutions to leverage cost-sharing training facilities and best practices (Robson et al., 2007).

Finally, regulatory and compliance difficulties are among the challenges of integrating OSH training with sustainability. Organizations that operate in multiple jurisdictions must deal with diverse regulatory requirements, potentially compromising the standardization of training programs (DiMaggio & Powell, 1983). To address this, a dynamic approach to OSH training that is adapted to local regulatory environments while aligning with global sustainability standards, such as the United Nations Sustainable Development Goals (UN SDGs), is required (Dyllick & Muff, 2016).

In conclusion, as far as OSH training is a influential tool for the advancement of a culture of safety, health, and sustainability, still its effectiveness is dependent on addressing underlying challenges such as organizational dedication, resistance to change, small resources, and regulatory complexities. Therefore, by integrating sustainability principles into OSH training programs, organizations can ensure to increase employees' consciousness, stimulate sustainable actions, and formulate policies towards the achievement of long-term sustainability goals.

IMPLICATIONS

This study is both theoretically and practically significant in that it connects Occupational Safety and Health (OSH) and workplace sustainability, which are two subjects of study that have remained discrete. It is theoretically significant in that the conceptual model invokes theory, including Social Learning Theory and Institutional Theory, to show how safety training could influence employees' behavior in a way that would benefit sustainability. It reframes OSH not merely as a tool for ensuring compliance with rules but as a vehicle for shaping workplace culture towards increased social and environmental responsibility.

From the point of view of application in the real world, the research presents concrete actions that can be taken by organisations and policy-makers. For businesses, the findings are that OSH training must go beyond learning safety rules to learning environmental and social responsibility. This is likely to include integrating content on reducing carbon emissions, safe waste disposal, and just treating workers. Such advancements would help in a reconciliation process with international standards, e.g., those laid out by the United Nations Sustainable Development Goals (SDGs), such as SDG 3 (Health and Well-being), SDG 8 (Good Work), and SDG 12 (Sustainable Consumption and Production).

The model also depicts how a confluence of safety and sustainability in training could lead to better workplace performance. Employees can get more motivated and involved, minimizing accident rates and improving the utilization of resources. Companies may also be more trusted by customers, investors, and society. To the advantage of this, companies can use web tools and interactive learning technology, such as web-based modules or gamified training. Offering rewards or bonuses to employees who participate to stimulate more efforts can be made effective.

For the makers of policy and government, this study demands new regulations and support systems. These could include updated safety guidelines that include sustainability goals, tax breaks or fiscal incentives for green-training companies, and improved government, business, and education supplier coordination. Support for small and medium-sized enterprises is especially critical, as they may not have the ability to develop advanced training. Public initiatives that offer collective social training facilities or expert counsel can fill this gap.

Therefore, this study not only adds to existing theory but also illustrates how OSH training can be improved in order to promote sustainability aims overall. Through adequate modifications in business strategy as well as public policy, training schemes can do more than make workers avoid getting hurt, they can help build a sustainable future for work and society.

CONCLUSION

This study offers a conceptual framework to explore the possibility that OSH training could be a driver of workplace sustainability. The framework shows that safety training can be much more than averting accidents, in that it can also promote greater goals like environmental protection, social responsibility, and organisational effectiveness. Key mechanisms like employee awareness, behaviour change, and workplace policies are highlighted as ways that OSH training can lead to sustainable workplace culture.

The study's findings suggest that OSH training plays a meaningful role in achieving both safety and sustainability goals. It supports progress toward the United Nations Sustainable Development Goals, especially SDG 3 (Health and Well-being), SDG 8 (Decent Work and Economic Growth), and SDG 12 (Responsible Consumption and Production). When companies include sustainability-related topics in their safety training programmes, they can improve employee involvement, reduce environmental impact, and support long-term organisational success.

As a conceptual paper, this study relies on theories and existing literature rather than empirical data. While this method is useful for building new theoretical models and identifying research gaps, it confines how confidently the framework can be applied in actual workplaces. The relationships proposed in the framework such as the link between OSH training and a sustainable workplace culture, have not yet been tested with real-world data. Hence, we cannot be certain that the framework will work the same way in every organisation or national context.

In addition, the framework does not consider the unique characteristics of specific industries. For instance, industries like construction, healthcare, or manufacturing each have different safety risks, regulatory requirements, and workplace cultures that may affect how OSH training is delivered and how it influences sustainability. These variances illustrate that what works in one industry may not be as effective in another. Likewise, governmental issues such regulations,

economic stability, and government incentives can determine how companies pursue safety as well as sustainability.

These limitations point to the necessity for future research to test the framework in other settings. Empirical research in every sector needs to be conducted to identify the extent to which the model holds in real organisational settings. Inter-states studies may reveal how cultural and legislative differences affect findings, while longitudinal studies may track the way the influence of OSH training on sustainability differs over time. By covering these sections, future studies can enable the model to be more precise and beneficial for both real-world and scholarly purposes.

Future research needs to use empirical methods to test propositions in this paper. Quantitative indicators such as experiments and surveys may evaluate the impact of OSH training on sustainability outcomes. Longitudinal research can also illustrate how such an impact endures over time. Researchers could also use qualitative methods, such as interviews and case studies, to explore how company culture, leadership, and employee views affect the success of integrated OSH and sustainability programmes.

It will also be helpful to examine how the framework works across different countries and industries. This can show what adjustments are needed for specific situations. By combining different research methods, future studies can give both stronger theories and clearer guidance for companies and policymakers. In this way, the study builds a foundation for future work that connects workplace safety with sustainability and supports the development of more responsible and resilient organisations.

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CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest to report regarding the present study.

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