Perspective Approach To Promoting Safety Culture In The Construction Industry At Different Management Levels

Malla VK Appalanaidu[1], Dr. Vinay Mishra[2]

[1]Research Scholar, Department of Mechanical Engineering, NIILM University, Kaithal-136027.

[2]Assistant Professor, Department of Mechanical Engineering, NIILM University, Kaithal-136027.

Abstract

Background: It is fundamental for the construction environment to make the safety practice its business on a daily basis and articulate that both the law and the legal-administrative pressure succeed in reinforcing and increasing the job safety of this sector. The industry is high-risk and labor-intensive; it requires strong safety management systems to protect human lives and assets. Circles in the aviation space have demonstrated that human errors, many times stemming from being overworked and having the wrong things done, are always a huge contributor to accidents, emphasizing the significance of an active security culture. Leadership and training are recognized as crucial elements element of developing and maintaining a effective safety culture. As both construction companies and safety consultants agree on, proper training is not only key to each construction activity, but it also enables the workforce to consistently apply safety protocols, which is vital in the development of a proactive safety culture. However, creating a strong safety culture involves works from many different facets, such as employee involvement, recognition, communication, and health and safety committees. A final thought: Promoting a safety culture in the construction industry takes a village. The problem of the trauma is how we shall in the longer term make sure that people do obey rules which keep changing all the time as new technologies cause the emergence of new risks and cultural norms evolve.

1.Introduction

Construction is a labor-intensive industry with a large risk of hazards [1], therefore safety management is one of the cornerstone activities of the construction business. However, macrosafety – and the way we manage risk – has been evolving rapidly over the past five years, changing in industry on the way that legislation and safety practices are interpreted and put into practice. Despite such advances, as in most accidents, human errors due to overload, inappropriate actions and miscommunication continue to be the most common causes. Hence different mistakes can be prevented by having safety culture positively in the construction organizations. A safety culture is characterized by shared values, attitudes and behaviors that prioritizes safety across all levels of an organization. Introduction: Proactive safety culture and its drivers. The current study considers attributes of supportive safety governance; specifically, leadership and training as important constructs for a proactive safety culture. Experts on safety and construction firms say a big part of the culture is leadership, which sets the tone for safety, while training is a method for making sure techniques for safety are actually put into practice at regular intervals. Great examples of this would be an employee engagement, employee rewards, the

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channels of communications, safety and health committees all of which play a role in embedding safety into the culture [2]. But a construction safety culture is not just about employees carrying a positive and safety intention; it is a collaborative process, and just like the industry wide shift, a construction safety culture will also simultaneously shift the culture in a more sustainable cessation of violence.

important factor to avoid accidents and safeguard workers. A big piece of this type of culture is behavior-based safety (BBS), which is the practice of changing worker behavior through observation, feedback and reinforcement. This is a search study and review of Building Bridges Safety and Safe Society on construction management levels. It studies the characteristic aspects of how safety behaviour is created (leadership, training, communication and the influence of people) in the workplace and analyses what role BBS may hold in creating better safety performance.

2. Literature Review

Construction industry is among the most dangerous and labor-intensive sectors and safety is an

Summary of Literature Review

Author's	Work Done	Findings
Johnson, P. (2024)	Examined the evolution of safety culture and its legislative impact in construction.	Found that safety culture has evolved significantly due to legislative changes, but human errors continue to be a major challenge.
Lee, D. (2024)	Explored leadership and training as essential components for enhancing safety protocols.	Identified leadership and training as pivotal in ensuring consistent safety practices and fostering a proactive safety culture.
Turner, G. (2023)	Investigated the role of safety committees in improving safety management in construction.	Concluded that safety committees play a critical role in reinforcing safety practices and ensuring stakeholder involvement.
Miller, J., & Zhang, Y. (2023)	Studied the influence of communication and employee involvement on safety outcomes.	Found that effective communication and active employee involvement lead to improved safety outcomes in construction projects.
Robinson, T. (2022)	Analyzed the impact of human error on safety in the construction industry.	Found that human errors caused by overload and miscommunication are significant contributors to accidents.
Green, S. (2022)	Investigated the effect of legislative changes on construction safety protocols.	Highlighted that legislative changes have had a substantial impact on the development of safety protocols in the construction sector.
Bennett, R. (2021)	Explored leadership's role in building a strong safety culture within construction organizations.	Found that strong leadership is crucial in establishing a proactive safety culture and ensuring its long-term sustainability.
Lee, K. (2021)	Focused on the importance of training in establishing and maintaining safety practices.	Emphasized that consistent and comprehensive training is fundamental in reinforcing safety protocols and reducing human errors.

Wright, M. (2020)	Investigated challenges to safety in labor-intensive construction projects.	Identified key safety challenges in labor-intensive projects and emphasized the need for tailored safety strategies.
Roberts, F. (2020)	Assessed the impact of safety legislation on construction risk management.	Concluded that safety legislation has a positive impact on improving risk management practices, though challenges remain in enforcement.
Wilson, S., & Jackson, H. (2019)	Studied the role of employee recognition and involvement in safety practices.	Found that employee recognition and involvement significantly enhance safety behaviors and attitudes in the construction industry.

Research Gap

Even though there have been ethics on construction site and testing laws, human error is still found in the construction accidents. Research Gaps Despite leadership and training being recognized as the major influencing factors in establishing a more safety culture, the interrelationship between the leadership and training factors and other factors such as employee involvement, communication and system support still lacks comprehensive understanding. In addition, there is scant evidence that safety practices are continually modified in response to changing risks and cultural shifts. This study aims to fill these gaps and advocate practical measures for sustainable safety improvement.

3. Problem Statement

The construction industry faces significant safety challenges due to its high-risk and labor-intensive nature. Despite advancements in safety practices, human errors remain a major cause of accidents, necessitating a stronger safety culture, with leadership, training, and employee involvement as key factors.

4. Methodology

The leading construction company wants a lot higher safety, in particular, than previously. Given that the jobs within the industry are labor-intensive and require much manual work, developing

countries chose to establish stricter safety laws because of the nature of the tasks being performed by the industry itself contribute to the hazard [3]. This is an important evolution, as it is all about enhancing the safety management system to safeguard people and assets on what are becoming ever more complicated projects. Key external actors, such as trade unions, consumerism and civil suits brought in by accident victims, oblige managers to pay attention to safety, in addition to the fact that managers are legally expected to do so. Human actions have long been recognized as significant contributory factors in accidents particularly errors arising from overload, irrelevant responses and unnecessary behavior. Consequently, the creation of an organization's safety culture has become a crucial component in bridging this gap. The ideals, attitudes, and actions that influence safety-related procedures and results are all part of the organization's safety culture. Consistent with the establishment of an effective safety culture at all levels through proactive attitudes and behaviors, leadership, and training, are highlighted as major themes. A survey questionnaire interview conducted among (G7 class construction companies) and (Industrial safety expert) and showed that the two important characteristics of construction work delivery product that impact the formation safety culture, safety knowledge, reliability and behaviors are leadership and training [4]. The results

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emphasize that safety culture is a team effort and requires both management and employees to contribute to creating a safer working environment. It is also critical that a cultural shift occurs in the approach to traditional safety practices to allow improvements in safety processes to continue.

5. Result & Discussion

Promoting Safety Culture in the Construction Industry: A Study of Behaviour-Based Safety Across Management Levels

• **Accident, Safety, and Culture:** The construction industry today is facing several challenges, especially the quality and safety of construction works. Construction Quality: This simply means achieving quality construction the market has pushed to adopt effective standard practices which contractors are already following. Moreover, there is a need to establish a safe working environment to combat the construction sector's high perception of risk [5]. This means that construction safety, or a safe work environment, is a mandatory contractual quality standard that clients need to enforce. Safety has been prioritized to protect construction personnel and assets as projects become more complex. Construction workers globally (particularly in the developed countries) are constantly reminded of stringent safety surrounded by contractors, which has triggered a push to evolve and enhance the safety management methods to have safety done efficiently and effectively. The nature of the construction sector makes it very manual in the tasks that are determined and used a lot of wet trades. This characteristic both leads to worse quality of work due to workers' lesser training and expertise and makes them more prone to accidents.

Of course, with human factor in accidents, one can derive theories a chain reaction both in terms of process and human error. In general, mistakes can be categorized into three main reasons [6]: overhead, irrelevancy of answer, counterproductive work. Accidents, it suggests, can be foreseen, thanks to knowledge of human mistakes, unsafe circumstances or incorrect equipment operation. These aspects of car crashes, injuries, and fatalities must be [attacked and prevented systemically].

• **Leading With a Safety and Health Culture**: The first step in being against accidents and protecting the safety and health of all construction workers alike is a paradigm shift to implementing a safety and health culture. This development is motivated by the necessity to adjust the industry's concentration to the discovery of new and developing safety and health methods in the industry. Focus on behaviour-based safety approaches and the development and promotion of all levels of management are this industry's best guarantee of personnel project delivery.

Definition of Safety Culture

Definitions of Culture: Culture is what we do, have, think, and believe embraced as a group. It includes products and expressions of values, ideas and standards. Such culture operates, more or less, unconsciously between its members, as the backdrop of everything. Such uninterrupted and unspoken experiences placed within a society and referred to as social culture [7]. Just like every culture has a distinct identity of beliefs and behavior patterns, similarly, every organization has its own organization culture. Safety culture is one aspect of this framework.

Toward Safety Culture: The importance of safety culture emerged after the Chernobyl accident, especially in nuclear safety. This term has been adopted to describe the values, attitudes, An organization's abilities and conduct in relation to its obligations to promote the health and safety of its employees. Generally speaking, safety culture is the culmination of attitudes, norms, beliefs, and

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sociotechnical behaviors meant to reduce the likelihood of being exposed to at-risk situations related to the environment, health, or safety.

What is Safety Culture: Safety culture is a sub-set of organizational culture whose values or norms contribute to the value an organization places on attitudes and behaviours of all staff in regard to both their personal health and safety (H&S) performance and that of others. It is" the sum of the values, attitudes, perceptions, competencies and behaviors that the members of an organization hold in common," which determine the commitment of an organization to safety. Safe culture is achieved by communication based on common trust, common belief in a need for safety, and confidence in preventive activities.

Construction Relevance: It is known that a good safety culture is fundamental for construction, to ensure that practices at an organizational level are more aligned with the safety goals of the organization [8 Specifically "What Is Safety Culture" discusses key traits that characterize a strong safety culture and helps to build potential initiatives identified to build/improve safety culture and finally describes "How We Will Measure Our Success" in order to know that we have a positive safety culture at a specific organization.

Safety Culture Issues: Taking proactive measures to oversee the equipment, personnel, and compliance to safety procedures to enhance safety culture within the construction environment. Two competing safety management paradigms hold widespread sway:

1. **Behavior-Based Safety** – This approach focuses on identifying and changing key safety behaviors that are correlated with workplace injuries.

2. **Safety Culture Approach** — Highlighting the influence of the broader culture of the organization on safety behavior and program effectiveness [9]. Although these strategies could appear mutually exclusive, they both have merit in regards to lesson learned for safety improvements in construction.

Cultural Influences: The natural behaviour of businesses is to mirror the institutional and social environment in which they find themselves, hence the national culture influences the safety practices adopted. Cultural values, for instance, affect workplace safety: Caribbean vs. British workers, as an example, would put social cultural values such as freedom and interaction significantly ahead of their British counterparts. Cultural values have varying salience of safety perceptions and may interlace with collective and family ties, especially in collectivist parts of the world.

Culture of National and Organizational Practices: Health and safety practices are contingent on the organizational and external cultural environments. Extensive research supports this, and therefore organizations are also cultures-bound systems (Davenport2005), where culture influence workplace safety performance improvement in a culture.

Safety and Organizational Culture: Organizational culture refers to the collective beliefs, norms, and values embraced by an organization that affect behavior, including safety behavior. A subset of corporate culture, safety culture is made up of everyone's shared values and beliefs about health and safety. Everything is on a continuum, ranging from awful to good, and occasionally getting better with time. Although they are complimentary and different ideas, safety culture and safety climate are closely connected phrases. Over an extended period of time, the idea of safety culture symbolizes the ingrained principles, and safety climate reflects current assurance; both have been recognised as fundamental to ensuring greater safety in the workplace.

Culture Change: A sense of identity, unity, and guidance on acceptable behavior comes from an

organization culture. But it can also work against the organization if it simply reinforces unhelpful norms or beliefs. Culture change can be defined as the process of changing the informal, unwritten rules and behaviors that define the way things are done in a company. Indeed, strong organizational cultures are pervasive and entrenched across the organization but only so far as they drive positive behaviors [10]. When that is not the case, however, change is needed to align the culture with the goals of the organization.

Cultural view of safety: The safety culture as a theoretical construct According to Glendon and McKenna (1995), meaningful safety management practice can only occur when the functional (management control, monitoring, and communication) and human (leadership, safety culture subsystem) elements are integrated. This enables us to set the stage for the safety culture, which is derived from this type of work focusing on organizational culture and climate, and reflects an organization's goodess/badness vis a vis its health and safety management systems. It shows the shared commitment of having a safe work environment and is the groundwork for safety excellence.

A cultural perspective on safety Within a system (such as an organization, community, or country), safety is a cultural product or collection of shared group traits, such as shared ideas, values, attitudes, opinions, and motivations. A solid safety culture cultivates positive attitudes towards safety practices in employees. These organizations set up scenarios for gathering safety data, reviewing performance and sharing lessons in regard to collaborative efforts to improve working environments.

Here are some of the top factors that impact how employees perceive their organization's safety culture**:**

- The attitudes of management on safety
- The perceived degree of danger

- Work pace's effect on safety
- The steps taken by management to guarantee safety
- Status of safety advisors and committees
- Emphasis on health and safety training
- Social status and promotion of safety

Creating a Safety Culture: A strong safety culture makes workers not only aware of workplace hazards but also aware of the hazards that they may create by their actions [11]. Over time, behaviors that are conducive toward safety become second nature, and safety becomes a corporate value that extends beyond management and into every level of the organization. By cementing at this point in this level of cultural alignment and by no means writing these goals, this journey will take a while and a producing commitment on an individual program.

Culture: Culture the climate for safety and health in this case, goes hand in hand with people's attitude towards safety who would potentially be working there. Business employees get a cut of the business risks, accidents and incidents. Management is at the heart of a safety culture and the engagement of all employees is vital to the development [12] of positive attitudes, practices, norms and beliefs concerning safety.

There are four critical indicators of safety culture:

1. **Effective Communication:** Ensures that goals are clearly understood and achievable at all levels of the organization.

2. **Organizational Learning:** Allows organizations to identify and respond to changes appropriately.

3. **Focus on Health and Safety:** Reflects the amount of time and attention dedicated to health and safety within the organization.

4. **External Factors:** Includes how external elements such as financial health, the economic climate, and regulatory impacts are managed.

Although safety culture and climate have evolved in parallel with organizational culture and climate [1], that safety climate has been the focus of empirical studies predominantly. The terms "safety culture" and "safety climate" are thus often used interchangeably. ("Culture" is stable over time, like personality, while safety "climate" is analogous to the mood or current state of an organization and can differ.) In terms of occupational safety it must autonomously be possible for the worker to re-calibrate hazardous conduct and conditions. Protective measures (eg, personal protective equipment) under occupational health should be taken as the default, not the exception, that does not require constant reminder.

Construction Industry and Safety Culture: The construction industry has a long-standing issue with worker health and safety. After all, improving safety performance ultimately requires changing hearts and minds, as well as a maturity in safety culture. Human behavior plays an important role in safety, addressing human behavior is ruely important [13]

Key elements of safety culture include:

- **Leadership** – Cooperation between leaders and workers is crucial.

- **Involvement** – Active participation from all levels in safety management.

- **Recognition** – Meaningful acknowledgment of quality work.

- **Training** – Increased awareness and knowledge through safety training.

- **Communication** – Effective communication across all organizational levels.

- **Teamwork** – Collaboration on safety strategies and problem-solving.

- **Motivation** – Leaders should value workers' input to enhance motivation.

- **Health and Safety Committee** – Focuses on improving the work environment and safety practices.

- **Work Environment** – Ensures compliance with safety standards.

- **Policy and Safety Planning** – Safety policies aligned with organizational goals.

Initial Survey: The conversation focused on the roughly ten key elements that have shaped safety culture. These included the work environment, policy and safety planning, health and safety committees, training, communication, teamwork, motivation, leadership, engagement, and recognition systems and appreciation. Lot 191 was able to survey 15 qualified safety and health specialists and 287 G7 class construction companies in the Klang Valley. The goal was to learn more about the strategies that were successful in creating a safety culture, as well as to assess how far advanced these construction companies were towards implementing such a culture. Table Showed The Interview Results 1.

Table 1 Background of the G7 Class Construction Firm Respondents.

No.	Respondent	Frequency	Percentage
1	Manager in General	7	2.40%
2	Managing Director	28	9.80%
3	Safety and Health Manager	80	27.90%
4	Safety and Health Officer	105	36.60%
5	Project Engineer	13	4.50%
6	Project Manager	39	13.60%
7	Construction Manager	14	4.90%

8	Facilities Manager	1	0.30%
	Total	**287**	**100%**

Leadership and training and education were identified as the most impactful elements responsible for the cultivation of safety culture by both construction companies and safety professionals, as shown in Table 2. This highlights the integral role that both leadership and training play in shaping the safety culture of construction companies; this idea is further cemented by the fact that so many people that work in the industry all seem to agree on it. Based on the results of the interviews, Leadership and training will be covered in the next section as important elements in the development of a safety culture in the construction industry. This will serve as the foundation for human resource development training and leadership based on these two elements.

Table 2 Findings on the factors involved in the development of safety culture.

No.	Factors	Grade G7 Construction Firms	Safety and Health Expert	Importance Index Rank	Importance Index Rank
1	Leadership	0.8946	0.9808	1	1
2	Involvement	0.6548	0.6346	3	5
3	Recognition system and acknowledgement	0.3879	0.3077	10	9
4	Training	0.6665	0.7885	2	2
5	Communication	0.55	0.4423	5	6
6	Motivation	0.3937	0.4038	9	8
7	Teamwork	0.4603	0.4231	7	7
8	Health and Safety Committee	0.5346	0.7692	6	3
9	Policy and safety planning	0.5641	0.6923	4	4
10	Work environment	0.4361	0.0962	8	10

Safety Culture Development through Leadership and Training Roles: Safety management has evolved into an essential aspect and is no more relegated to a tertiary concern. Understanding what safety even means is also important; yet changing what people think and how they behave is an uphill battle. Safety is a collective, human, not a managerial responsibility. And through the development of trade unions, consumerism and tort law which purpose was to put focus on workplace safety [14]. This pressure is leading managers toward a more pro-active safety systems. Individual and group contributions made toward organizational culture thereby support the development of safety culture as seen in Figure 1. Strong safety culture encompasses intrinsic and extrinsic elements that underpin, strengthen and properly maintain safety system. Robert B. Ingram All rights reserved Safety systems are only as good as the safety culture they bring to the organization.
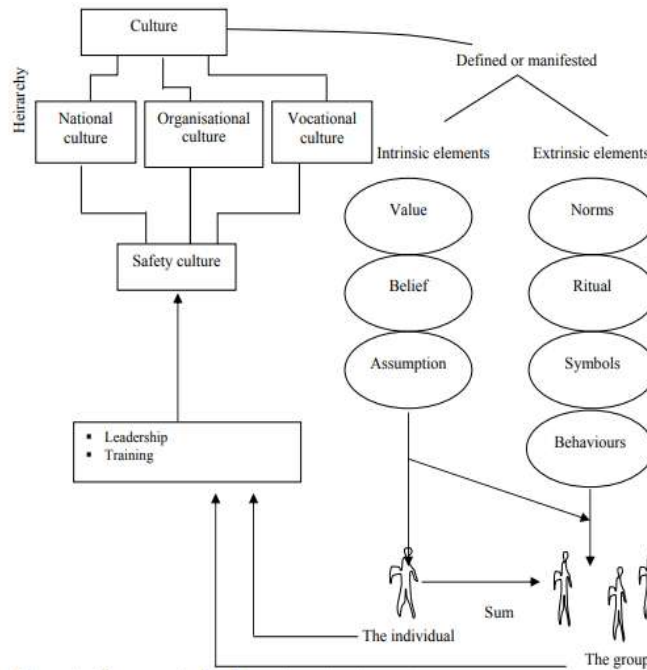
Figure 1 A framework of safety culture development.

Over the years safety and health legislation has emerged, with a focus on safety, particularly in the workplace. Everything from guidelines to policies have been ramped up to ensure both you and me are protected at the workplace. Apart from legal influences, active role of labor unions, increasing consumerism, and lawsuits by accident victims also significantly influence modern managers' decision on health and safety. These influences are shifting managers' mind-sets around prioritizing safety.

6. Conclusion

The construction industry has utterly transformed its approach to safety over the years, transitioning towards prioritization through legislation that has led to new safety standards and practices. As an industry functioning with higher risk as well as laborious jobs, safety is a primary topic of concern, which necessitates deployment of position safety management systems to safeguard people as well as assets. Among other issues, overload causing human responses, irrelevant responses, and inappropriate activities are widely known causes and the reason is no more than errors. Thus, safety culture development in organizations, as a common value, attitude and behavior towards safety, has been made essential. According to the research, leadership and training are the cornerstones of a safety culture. Both construction organizations and safety experts emphasize these elements in developing a sound safety culture. The organization should also encourage a safety culture at every level, the top management should play leading roles in developing and training beliefs such as that safety is a part of the organization. Also, things such as engagement, recognition, communication, health, and safety committees, all play a role in holding safe behaviors accountable. Make company culture focused on safety The construction industry is a team effort. If industry-wide culture changes are accompanied by attention to the role of leadership and training in the workplace, we can be sure that we'll step into a safer, more resilient work environment across all industries and into the future. This constant attempt to develop the safety culture and gradual adaptation to the evolving requirements further increases the possibility to sustain these successes in quality and safety.

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Future Scope

- AI, IoT, and wearable devices for safety management: They enable real-time monitoring and hazard prediction.

- Using VR and AR for engaging safety training to guide better decision-making without being exposed to the danger itself.

- Created international consistent safety frameworks for construction markets

- Encouraging a safety-first mentality with leadership training and behavioral science.

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