

Navigating Safety Horizons: A Qualitative Exploration of Jobsite Safety Orientations in the US Construction Industry

Roxana Poushang Baghery, Matthew D. Reyes

Abstract—This paper presents a comprehensive investigation into jobsite safety orientation programs within the US construction industry. Through interviews with industry professionals, this paper explores the domains of safety roles, daily safety practices, safety culture, and experts' insights. This study underscores the pivotal significance of safety orientation programs, addressing their content, coordination, technology integration, and emergency procedures. Key findings emphasize the influential roles of leadership, language, and technology in the enhancement of these programs. Advocating for a paradigm shift, this paper calls for a multifaceted approach rooted in engagement, leadership commitment, clear communication, technological integration, simplicity, and a persistent pursuit of improvement in safety orientations. This study significantly contributes to the ongoing evolution and enhancement of safety practices, ensuring the safety and success of construction projects and, above all, the safeguarding of its workforce.

Keywords—Jobsite safety orientation, construction industry, safety culture, workplace incidents.

I. INTRODUCTION

SAFETY orientation programs in the US construction industry play a pivotal role in mitigating workplace incidents and ensuring the well-being of workers. As the construction sector grapples with inherent risks and challenges, a robust safety culture becomes imperative.

The construction industry is renowned for its dynamic and multifaceted nature, with diverse roles and responsibilities contributing to the complexity of ensuring a safe working environment. Safety orientation programs serve as the cornerstone for instilling safety consciousness among workers, fostering a culture where adherence to safety protocols is not just a requirement but a shared value. Understanding the challenges, practices, and perspectives within this context is crucial for identifying areas of improvement and implementing strategies that resonate with industry.

Reference [1] explored predictors for severe construction accidents, emphasizing the need for integrated predictive models. It identified 254 potential predictors, including novel business factors, and aimed to create a unified predictive model. Reference [2] investigated workers' habituation to construction hazards using Virtual Reality, noting a decline in vigilance over time. The study suggested that VR-based interventions could mitigate risk habituation, but broader

applicability requires further validation. Reference [3] highlighted employers' responsibility for safety training orientation, particularly in General Contractors (GCs) ensuring proper training for their workforce. Reference [4] assessed the effectiveness of safety program elements, with safety orientation leading to a risk reduction score, emphasizing its importance for all new employees. Reference [5] suggested that formal safety orientation for new hires could result in lower average experience modification ratings (EMR) for construction companies, though the focus was narrow. Reference [6] recommended prioritizing training and orientation programs for newly appointed foremen, with companies having lower EMRs associated with longer programs. Reference [7] examined the impact of safety orientation on decreasing injury rates, revealing a significant reduction, especially among plumbers and pipefitters. Reference [8] identified inadequate access to information, measurement technology, and PPE as contributors to hazardous exposures, emphasizing the potential role of comprehensive safety orientation. Reference [9] highlighted that effective safety orientation leads to cost savings and plays a critical role in achieving sustainable and productive outcomes for organizations. Reference [10] introduced a data-driven safety framework predicting fatal accidents in construction, with a focus on key factors and adaptability across firms. Reference [11] conducted a meta-analysis on safety leading indicators, identifying safety training/orientation as crucial in predicting safety performance across diverse construction projects. Reference [12] introduced an AI-driven method to spot construction equipment hazards through sound, offering cost-effective deployment on workers' smartphones.

The literature review highlights the crucial role of safety orientation in construction, calling for a detailed analysis of its components to improve worker protection. Identifying a gap in existing literature on the specific effectiveness of these components, this paper aims to address this by identifying effective characteristics and proposing enhancements to jobsite safety programs in the US. This paper delves into the intricacies of safety orientation programs, aiming to unveil key practices and strategies that can enhance their effectiveness. Through qualitative research involving interviews with industry professionals, this paper seeks to provide valuable insights that can inform a comprehensive approach to address safety concerns in construction sites.

Roxana Poushang Baghery and Matthew D. Reyes are with the Christopher C. Gibbs College of Architecture, University of Oklahoma, Norman, OK 73019 USA (e-mail: rpbaghery@ou.edu, mdreyes@ou.edu).

II. METHODOLOGY

The qualitative research approach, utilizing semi-structured interviews, is chosen to explore the experiences and perceptions of professionals in the US construction industry regarding safety orientation programs. Purposive and convenience sampling techniques are applied to ensure diversity among participants. Thematic analysis is utilized for data analysis, complemented by descriptive and analytical statistics. Validity is enhanced through consistent questioning and a focus on external validity by including participants from various states of the US.

III. RESULTS AND ANALYSIS

This section provides a comprehensive analysis of the results obtained from the interviews with eight professionals in the US construction industry. The participants, holding diverse roles and experiences, contributed valuable insights into the domain of jobsite safety orientation programs. The analysis is structured around demographic and background information, safety roles and practices in the construction industry, safety orientation practices, and strategies for ensuring worker compliance and understanding.

A. Demographic and Background Information of Interviewees

Table I outlines the demographic and background details of the interview participants, including their interview durations, current roles, experience in the construction industry, experience in current roles, location, and company size. The

TABLE I
 DURATION OF THE INTERVIEWS AND DEMOGRAPHIC AND BACKGROUND INFORMATION OF INTERVIEWEES

Interviewee	Interview Duration	Job title	Experience in Construction Industry (Years)	Location (State)	Company Size (Number of Employees)
1	37:54"	Vice President for Operations	25	OK	2-10
2	33:25"	Corporate Head of Safety	14	NC	201-500
3	55:19"	Safety Manager	9	NC	201-500
4	25:42"	Safety Manager	20	SC	201-500
5	33:36"	Safety Manager	45	PA	51-200
6	22:31"	Safety Manager	35	IL	11-50
7	33:36"	Project Engineer	11	TX	5,001-10,000
8	35:50"	Corporate Head of Safety	32	CA	1,001-5,000

- b) *Safety Consultation*: Some professionals assume roles involving safety consultation or advisory responsibilities. They provide valuable guidance and consulting services concerning safety practices. While they may not directly manage on-site safety, their expertise is critical in advising clients or organizations on safety matters. This highlights the importance of external perspectives and specialized safety advice in the industry.
- c) *Safety Integration*: Certain professionals, such as project engineers, emphasize the integration of safety into the work culture. They promote a holistic approach in which everyone, regardless of their role, shares responsibility for identifying safety hazards and promptly reporting them. This approach underscores that safety is not merely a standalone function but an integral part of daily

diversity in roles, ranging from Vice Presidents to Project Engineers, highlights the comprehensive nature of the study. The varying years of experience, spanning from 9 to 45 years, indicate a mix of mid-career professionals and seasoned veterans, enriching the study with diverse perspectives.

B. Safety Roles and Practices in the Construction Industry

The construction industry is well-known for its inherent risks and challenges, emphasizing the paramount importance of safety. An analysis of responses from eight industry experts has shed light on the diverse roles and daily safety management approaches within this context, offering valuable insights, which will be discussed below.

1) Safety Roles and Responsibilities

A notable observation arising from the analysis of interviews is the diversity of roles and responsibilities in the context of safety within the construction industry. These roles can be broadly categorized into four common themes:

- a) *Safety Oversight*: Many professionals hold positions directly tied to safety oversight. Their primary responsibility is to establish and ensure the effective implementation and adherence to safety policies and procedures within their respective organizations. For example, professionals like the corporate head of safety oversee safety policies and procedures at a high organizational level. This theme underscores the vital role of dedicated safety experts in shaping and enforcing safety standards.

- operations and decision-making.
- d) *Corporate Safety Leadership*: Some professionals, like the corporate head of safety, occupy high-level leadership positions with responsibilities extending beyond individual projects. These roles are distinctive in their focus on developing safety standards, mentoring safety professionals, and ensuring safe practices across the organization. They exemplify a top-down approach to safety management, highlighting the strategic importance of safety leadership.

2) Confronting Challenges and Embracing Diversity

The analysis of interviews also sheds light on challenges within the construction industry. Emphasizing multilingual communication underscores the significance of overcoming

language barriers to ensure that all workers comprehend safety instructions. This aspect is especially pertinent in construction, where diverse workforces are prevalent.

C. Safety Orientation Practices: Enhancing Construction Site Safety

Through systematic analysis of responses from eight construction industry professionals, this paper synthesizes key insights and practices related to safety orientations in the construction sector. The analysis covers topics such as the importance of safety orientations, their content, coordination, technology integration, and emergency procedures. It provides valuable guidance for creating effective safety orientation programs in the construction industry.

1) Importance of Safety Orientations

All interviewees unanimously emphasized the paramount importance of safety orientations in construction. These orientations serve as the initial line of defense against potential hazards and accidents, laying the foundation for maintaining a secure work environment. Key points highlighted include:

- a) *Mandatory Requirement:* Safety orientations are universally mandated, constituting an integral component of construction projects. They are a prerequisite for all individuals, including employees, subcontractor workers, and visitors, before gaining access to a job site.
- b) *Foundation for Safety Culture:* Safety orientations play a pivotal role in shaping the safety culture of construction companies. They introduce workers to the company's values, expectations, and unwavering commitment to safety. In turn, this fosters a collective sense of responsibility for upholding a safe work environment.
- c) *Emergency Preparedness:* Safety orientations encompass comprehensive emergency procedures that encompass evacuation routes, first aid, and injury reporting. This equips workers with the essential knowledge necessary for responding swiftly and effectively to emergencies.
- d) *Relevance to the Job:* The content of safety orientations is tailored to the specific job and the potential hazards workers may encounter. This customization ensures that training is directly applicable to the tasks at hand.

2) Key Elements of Safety Orientation Programs

Interviewees identified several key elements deemed essential for inclusion in effective safety orientation programs. These elements play a vital role in fostering a safety culture and equipping workers to effectively mitigate risks:

- a) *Clear Chain of Command:* The clear definition of the chain of command and the authority structure on a job site is of paramount importance. This ensures that workers are aware of whom to approach for directions and to address safety concerns.
- b) *Emergency Procedures:* Thorough emergency procedures, encompassing evacuation plans, contact information, and incident reporting protocols, are indispensable for ensuring swift and coordinated responses to emergencies.
- c) *Relevant Safety Topics:* Covering a comprehensive array of pertinent safety topics, including fall protection,

electrical safety, and hazard communication, ensures that workers possess a well-rounded awareness of potential risks.

- d) *Tailored Training:* Customizing the safety orientation program to align with the specific requirements of the workforce and the job site enhances engagement and the direct applicability of the training.
- e) *Company Introduction and Culture:* Introducing workers to the company's culture and values lays the foundation for shared responsibility and a commitment to safety.
- f) *Mindset and Behavior:* Addressing worker mindset and underscoring the importance of prioritizing safety over speed can lead to safer behaviors on the job site.
- g) *Language and Communication:* Ensuring that safety orientation materials and instructions are available in multiple languages effectively addresses language barriers and enhances comprehension among a diverse workforce.
- h) *Engagement and Participation:* Encouraging worker engagement and participation through interactive elements and opportunities for questions fosters a culture in which workers feel at ease reporting safety concerns.
- i) *Expectations and Stop Work Authority:* Clearly articulating expectations for workers and empowering them with the authority to halt work when safety concerns arise reinforces a safety-conscious environment.

3) Coordination and Frequency of Safety Orientations

The coordination and frequency of safety orientations are contingent on factors such as project size, complexity, and the nature of the work. Interviewees provided valuable insights into how orientations are typically managed, which are outlined below:

- a) *Mandatory Pre-Work Requirement:* Safety orientations are universally mandated before commencing work on a construction site, irrespective of whether individuals are employees, subcontractors, or visitors.
- b) *Frequency and Timing:* The frequency of safety orientations varies, with some projects conducting them daily or even twice a day, particularly on larger sites with multiple shifts. Others schedule orientations on specific days, such as Mondays or Fridays, to accommodate new labor starting on those days. Most orientations are held at the outset of the workday to minimize disruptions and ensure preparedness.
- c) *Duration:* The duration of safety orientations fluctuates, contingent on project complexity, ranging from brief sessions lasting 5-6 minutes to more extended orientations lasting up to an hour and a half. Longer orientations are typically associated with projects featuring additional safety considerations.
- d) *Coordination Responsibility:* Safety orientations are frequently organized by project management or safety professionals. General contractors often shoulder the responsibility for establishing conditions and requirements for subcontractors and their employees.

4) Technology's Role in Safety Orientations

The role of technology in enhancing the effectiveness of safety orientations was a central topic discussed by the interviewees, leading to several key observations as follows:

- a) *Interactive Learning and Engagement*: Technology can enrich safety orientations by creating interactive and engaging experiences. This might involve integrating quizzes, exams, or checklists into digital platforms, ensuring active participation and improving knowledge retention.
- b) *Learning Management Systems (LMS)*: LMS platforms can efficiently structure and deliver safety orientations. They facilitate progress tracking, assessments, and documentation of completion, providing an organized approach to orientation.
- c) *Remote Training and Efficiency*: Technology enables remote training, making it possible to reach workers regardless of their physical location. Online courses and video conferencing facilitate efficient orientation delivery.
- d) *Virtual Reality (VR) and Simulation*: VR and simulation technologies offer immersive safety training experiences. Workers can engage in lifelike scenarios to practice safety protocols and emergency responses, enhancing experiential learning.
- e) *Data Collection and Analysis*: Technology allows for data collection and analysis to monitor safety compliance, such as the use of personal protective equipment. These data can identify trends and areas for safety improvement.
- f) *Documentation and Record-Keeping*: Digital platforms efficiently store and manage orientation records, reducing the risk of data loss and ensuring easy access to historical information.
- g) *Language and Accessibility*: Technology can address language barriers by providing orientation materials in multiple languages through digital platforms, enhancing accessibility for a diverse workforce.
- h) *Monitoring and Surveillance*: Monitoring technology, such as cameras, can be employed to identify safety concerns in real time. This proactive approach can help prevent accidents by detecting issues before they escalate.

D. Strategies for Ensuring Worker Compliance and Understanding

Creating an effective safety orientation program necessitates a multifaceted approach. The professionals interviewed unanimously agreed on several fundamental strategies, outlined as follows:

- a) *Engagement and Relevance*: Safety training should be engaging, relevant, and captivating to effectively capture workers' attention. Training modules that are dull or monotonous prove to be ineffective.
- b) *Leadership and Supervision*: Commitment to safety at all levels, from foremen to project managers, establishes the tone for adherence to safety protocols. Supervisors must lead by example to foster a culture of safety.
- c) *Continuous Communication*: Regular communication with workers, one-on-one discussions, and addressing

queries in real-time are crucial for reinforcing safety procedures.

- d) *Trust and Accountability*: Striking a delicate balance between trusting workers to follow safety procedures and holding them accountable for compliance is essential for a successful safety orientation program.

E. Challenges and Solutions in Safety Orientation Implementation

The implementation of safety orientation programs is not without its challenges. The professionals highlighted several hurdles and innovative solutions, as detailed below:

- a) *Attendance and Participation*: Ensuring participation and attendance is essential for program effectiveness.
- b) *Language and Cultural Barriers*: Overcoming language and cultural barriers through bilingual orientations and culturally sensitive approaches bridges communication gaps and enhances understanding among diverse workforces.
- c) *Resistance and Complacency*: Identifying resistant workers and providing targeted intervention and education addresses behavioral challenges.
- d) *Relevance and Engagement*: Streamlining orientation content and focusing on critical information guarantees that experienced workers remain engaged and find value in the program.

F. Measuring the Effectiveness of Safety Orientation Programs

Evaluating the impact of safety orientation programs presents challenges, but it is a critical aspect of ensuring continuous improvement. The interviewed professionals employed various methods, as outlined below:

- a) *Insurance Modifiers*: Quantitative measurements, such as insurance modifiers, offer a numerical reflection of safety performance, indicating the effectiveness of orientations.
- b) *Comparative Analysis*: Comparing accident history before and after the implementation of orientation programs provides insights into the program's influence.
- c) *Software Tracking*: Utilizing software programs to monitor required training and compliance offers a structured approach to assessment.
- d) *Engagement Indicators*: Engagement during pre-task plan meetings and adherence to safety rules serve as indirect indicators of orientation effectiveness, emphasizing the behavioral aspect of the safety culture.

G. Enhancing Jobsite Safety Orientations in the US Construction Industry: Insights and Recommendations from Industry Experts

The interviews conducted with professionals in the US construction industry have provided valuable insights and recommendations for improving jobsite safety orientation programs. These insights can inform a comprehensive strategy to address the persistent issue of workplace incidents in the construction sector. In what follows, we will synthesize the opinions of the interviewees and the systematic analysis of their responses regarding ways to improve safety orientation

programs. These insights will guide us in understanding how to enhance safety orientation programs effectively.

1) Engagement as a Core Principle

Interviewees unanimously stressed the need for engaging, interactive, and memorable safety orientations. A departure from traditional, mundane methods, an engaging approach ensures active participation, enhances understanding, and fosters a culture of safety consciousness among workers.

2) Clarity, Communication, and Tailoring

The significance of clear communication emerged as a pivotal theme. Safety orientations must not only outline rules and regulations but also communicate the 'why' effectively. Tailoring orientations to specific worker demographics and job roles ensures relevance, enhancing comprehension and retention of critical safety information.

3) Leadership and Top-Down Commitment

Leadership commitment was highlighted as a cornerstone of effective safety programs. Interviewees emphasized that commitment should permeate from the executive level down to the job site, with leaders setting examples through personal involvement. This top-down approach fosters a culture where safety is not just a priority but a deeply ingrained value.

4) Language and Cultural Considerations

Recognizing the linguistic and cultural diversity within the industry, interviewees emphasized the importance of delivering orientations in languages understood by the workforce. Addressing diverse cultural backgrounds ensures that safety information is universally comprehensible, leaving no room for misunderstanding.

5) Utilizing Technology and Innovation

The integration of technology, such as online platforms, emerged as a solution for engaging a tech-savvy workforce. Interactive online modules can cater to various learning styles, making the orientation process more immersive and effective. Additionally, banning distractions like cell phones during orientations ensures participant focus.

6) Simplification and Focus

Simplifying the orientation process by focusing on core, frequently encountered topics emerged as a pragmatic strategy. Overloading workers with excessive information dilutes the effectiveness of orientations. By focusing on pertinent, day-to-day scenarios, orientations can be more impactful and actionable.

7) Peer Review and Hierarchy Understanding

Interviewees underscored the importance of external perspectives. Having an unbiased external entity review the orientation program provides valuable feedback, pinpointing areas of improvement that might be overlooked internally. Additionally, understanding the hierarchical structure of job sites ensures effective communication channels, preventing misunderstandings and enhancing coordination.

8) Mindset and Continuous Improvement

The importance of instilling the right mindset, both in instructors and learners, cannot be overstated. Orientations should not merely be a procedural formality but a fundamental understanding of personal safety responsibilities. Furthermore, a culture of continuous improvement was emphasized, where each orientation serves as a learning opportunity to refine future iterations continually.

IV. CONCLUSION

This comprehensive study, rooted in insights from professionals within the construction industry, unveils critical best practices and implementation strategies for contractors to bolster the effectiveness of safety orientation programs.

Employers or contractors aiming to enhance safety orientations should prioritize the following key practices:

- a) *Engaging Approaches*: Implement interactive methods to ensure active participation and retention of safety knowledge.
- b) *Leadership Commitment*: Establish unwavering commitment to safety from top-tier leadership downwards, fostering a culture that prioritizes safety at every level.
- c) *Clear Communication and Tailoring*: Communicate safety protocols clearly while tailoring orientations to diverse demographics and job roles, ensuring relevance and universal understanding.
- d) *Simplicity and Focus*: Streamline orientation content by emphasizing core, frequently encountered safety topics for maximum impact.

Furthermore, contractors can strengthen their safety orientations by implementing the following strategies:

- a) *Continual Education*: Offer periodic refresher courses to reinforce safety practices and update workers on evolving protocols.
- b) *Multilingual and Culturally Sensitive Approaches*: Ensure orientations are accessible in multiple languages and culturally sensitive for universal understanding.
- c) *Embrace Continuous Improvement*: Foster a culture of ongoing enhancement, utilizing feedback loops to refine orientations continuously.
- d) *Leveraging Technology*: Employ technology for interactive experiences, utilizing online platforms and simulations to enhance effectiveness.

Moving forward, the continual refinement and seamless integration of safety orientations into operational frameworks remain paramount. It is imperative for employers or contractors to ingrain the ethos of prioritizing worker protection in every facet of construction endeavors. This paper serves as a catalyst for ongoing discussions and adaptations, guiding the construction industry toward safer, more resilient work environments.

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