

ENH531 - Environmental Health Project

2024-25

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***“An Evaluation on the Effectiveness of Incentives in Construction Health
and Safety”***

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Abstract

The culture and opinions around health and safety within the construction industry remain a challenge to shift. With safety incentive programmes being implemented on sites to improve safety and reduce accidents/incident rates, there has been hope that these programmes will help to shape a positive safety culture, particularly through motivation and engagement. However, there remains to be scepticism around the long-term effectiveness of these programmes. This study aimed to critically evaluate the impact and reliability of safety incentive programmes on health and safety outcomes in the construction sector. A mixed-methods approach was adopted, using a structured questionnaire completed by 53 industry professionals. Both quantitative and qualitative data were analysed to assess perceptions, effectiveness, and potential drawbacks in relation to these incentives.

The findings suggest that safety incentive programmes are generally perceived as effective in improving motivation to adhere to safety standards as well as enhancing engagement and safety culture. However, their direct impact on reducing incidents remains a topic for debate. Toolbox talks were rated the most effective communication method of implementing these incentives, supporting the importance of face-to-face, discussion-based communication in promoting engagement. Concerns were raised regarding under-reporting and misuse of safety incentive programmes, such as contractors prioritising social media recognition or diverting schemes from their original safety focus. This misuse may involve using incentives to pressure workers into completing tasks more quickly or working longer hours, potentially compromising their safety and well-being, and leading to negative outcomes that undermine the reliability of safety data. The study concludes that safety incentives may be beneficial if carefully designed, integrated within broader safety systems, are regularly reviewed and consistently ongoing.

Key Words:

Safety incentives, Workplace incidents, Construction, Employee engagement, Safety culture, Behaviour, Motivation.

1.0 Introduction

The construction industry remains one of the most hazardous industries worldwide, accounting for a significant number of workplace injuries and fatalities each year. Despite strict regulations and safety protocols, workplace accidents remain a major concern. According to statistics provided by the HSE in 2023/24, there were 138 workers killed in work-related accidents, with 51 of the deaths accounted for from the construction industry. Many construction sites/companies have begun to run safety incentive programmes with the aim to mitigate these risks and promote a culture of safety. These programmes often reward workers and teams for maintaining safe behaviours, achieving accident-free milestones, and recognising and reporting both safe and unsafe practises. However, it is also argued that in relation to Lost Time Injury Frequency Rate (LTIF), “such schemes may also have negative effects of encouraging under-reporting of incidents or applying pressure on workers to return to work before they are suitably recovered to reduce the LTIF rate” (Lingard and Rowlinson, 2005).

The research will evaluate the effectiveness of safety incentives in reducing incidents and promoting a proactive safety culture in construction. By analysing data and identifying flaws in current practices, the study aims to determine if these incentives are a viable long-term strategy. The findings will determine the effectiveness of safety incentives in improving health and safety as well as promoting a good safety culture through employee engagement.

1.1 Research Question

How effective are safety incentive programmes in reducing workplace incidents and promoting a positive safety culture within the construction industry?

1.2 Research Aim:

Aim: To critically evaluate the impact and reliability of safety incentive programmes on health and safety performance in the construction industry.

1.3 Objectives:

1. To explore the types of safety incentive programmes commonly implemented in the construction industry and their intended outcomes.
2. To evaluate the effectiveness of safety incentives in reducing workplace incidents and to explore their influence on workers' safety attitudes, behaviours, and engagement in fostering a positive safety culture.

3. To identify potential drawbacks of safety incentives.

The findings will provide insights into the viability of safety incentives as a long-term strategy for improving construction health and safety, informing best practices for future implementation.

2.0 Literature Review

Over the years, the construction industry has rapidly evolved, with workplace safety becoming increasingly important. Various methods have been implemented to reduce accidents and improve safety practices. Ahmed and Faheem (2020) highlight a gap in previous research, noting that many studies focused primarily on safety management systems without differentiating the specific safety intervention practices that may have varied effects on workers' safety outcomes. Furthermore, they observe that despite the growing emphasis on workplace safety, reported injuries and accidents continue to rise. In response, safety incentives have gained popularity as an intervention; however, their effectiveness and unintended consequences remain widely debated. Cox and Jones (2006) noted that behaviour-based approaches often lose effectiveness once incentives are removed, with their sustainability reliant on the continued commitment and support of the implementing organisation and its leadership.

Safety incentives have a role in and are a part of health and safety management systems as well organisational culture as they are a way of engaging workers. Relevant guidance, including HSG65 - Managing for Health and Safety, highlights the importance of leadership, worker involvement, and continuous improvement as key elements of effective health and safety management (HSE, 2013). Additionally, HSG48 - Reducing Error and Influencing Behaviour emphasises the importance of understanding human factors, including how behavioural reinforcement mechanisms, such as incentives, shape safety performance (HSE, 1999). Complementing this, ISO 45001, the international standard for occupational health and safety management systems, reinforces the need for worker consultation and participation, demonstrating how engagement strategies like safety incentives can play a role in building a culture where safety is prioritised and valued (ISO45001, 2018).

The aforementioned guidance demonstrates how safety incentives are tools that can support the development of a positive safety culture, depending on how they are designed and implemented. Therefore, understanding their impact on safety attitudes, behaviours, and engagement, in addition to their influence on incident reduction is essential for assessing their overall effectiveness.

2.1 Safety Incentives in Construction: Types and Implementation

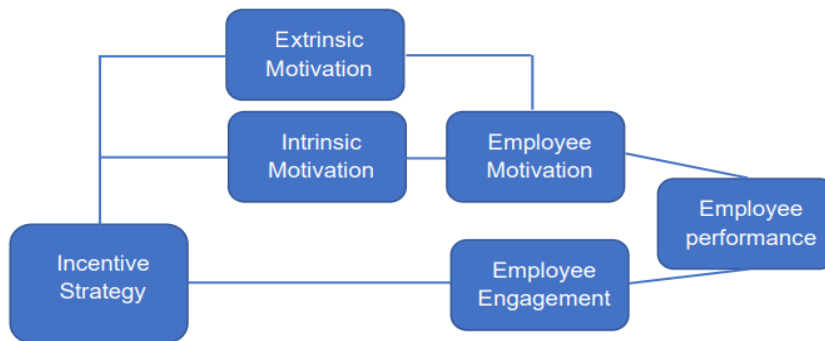
Many construction companies implement safety incentives to encourage compliance as well as to develop a proactive safety culture by influencing workers' attitudes and perceptions toward workplace safety. Karakhan and Gambatese (2018, p 1) defined incentives as "motivations associated with future rewards, either extrinsic or intrinsic, that are contingent upon the fulfilment of future conditions determined ahead of time before the start of work operations". Within the construction industry, safety incentive programmes vary between injury/illness based and behavioural based. With incentives ranging from extrinsic monetary rewards such as bonuses, gift cards, tools, or work gear to intrinsic non-monetary methods such as recognition leading to personal satisfaction rather than material rewards. Lee and Kim (2024) expressed how there are two main types of incentive programmes; Outcome Based Safety Incentive Programmes (OBSIP), and Behaviour Based Safety Incentive Programmes (BBSIP). While OBSIP focuses on results such as injury free milestones, BBSIP focuses on specific behaviours. In construction it is believed that BBSIP are more effective as the absence of accidents does not always reflect compliance. Therefore, emphasising behaviours rather than outcomes encouraging adherence to safety procedures, which in turn helps to mitigate the root cause of accidents.

2.2 Safety Incentives and Employee Engagement

Empirical research has demonstrated that incentives serve as an effective method of employee engagement, with studies showing a significant positive correlation between monetary incentives and employee engagement (Choong Yu'Hui et al., 2012). This statistical evidence supports that incentives can motivate employees to work safely to receive rewards or recognition, ultimately contributing to a positive safety culture and safer work environment. Research highlights that when organisations prioritise safety and engage employees in safety-related activities, overall safety culture and performance improve (Abeje and Luo, 2023). Employee engagement encourages a proactive approach to risk management, reinforcing the importance of a safe and collaborative work environment. Worker involvement in safety also helps reduce the likelihood of human error by increasing awareness of tasks, surroundings, and potential risks. By actively participating in safety activities, employees become more aware of their actions, leading to improved safety performance as reflected in standard safety outcomes (Wachter and Yorio, 2014). The relationship between incentive strategies, employee motivation, engagement, and performance are crucial in assessing the effectiveness of safety incentives in construction. As illustrated in **Figure 1**, incentive strategies influence both extrinsic and intrinsic motivation, which in turn impact employee engagement and

overall performance. This framework, as presented by Pretorius (2021), aligns with existing literature emphasising the role of motivation in shaping workplace safety behaviours.

Figure 1: Conceptual Framework



(Source: Pretorius, 2021)

2.3 The Relationship Between Safety Incentives and Incident Reduction

Studies have successfully explored the impact of safety incentives on incident reduction; one study by Yeow and Goomas (2014) combined the strengths of both behaviour based and outcome based (injury/illness based) programmes to identify the effectiveness, with results showing that the programme reduced accidents by 75%. Hasan and Jha as cited in Ahmed and Faheem (2020), identified safety incentives as the most influential factor in workplace safety in India, highlighting their role in shaping a positive safety environment. Additionally, highlighting that regularly provided incentives provide greater benefits than occasional rewards. According to Maliha et al. (2021), establishing a reward policy alongside safety education and training enhances the reporting of accidents and unsafe acts, reinforcing a culture of accountability and hazard awareness. Suggesting that when workers are incentivised and educated to monitor their own safety behaviours and avoid unsafe practices, safety awareness increased which would in turn significantly reduce safety related workplace incidents. The Reinforcement Theory, established by B.F. Skinner, is one of the oldest theories of motivation, demonstrating how behaviour is shaped by its consequences. According to Skinner, "the external environment of the organisation must be designed effectively and positively so as to motivate the employee" (Amutan, 2014, p 682). This theory focuses on how changes occur in individuals as they engage in certain behaviours, reinforcing or discouraging specific actions based on external stimuli and is a powerful tool for controlling behaviour and guiding individuals toward desired actions (2014). In the context of safety incentives in construction, this theory suggests that rewarding workers for adhering to safety protocols can reinforce safe behaviour and reduce workplace incidents. When employees receive positive reinforcement, such as financial bonuses, for maintaining safety standards, they are more likely to repeat these behaviours. However, while the

benefits of safety incentives in incident reduction are clear, it is important to recognise that these programmes may not be without their limitations. Potential drawbacks warrant further investigation to understand the full impact of safety incentive programmes on construction site safety.

2.4 Potential Drawbacks and Ethical Concerns

While safety incentives are widely used in construction, their effectiveness remains a topic for debate, with many potential drawbacks and ethical concerns. Critics argue that poorly structured incentive programmes may prioritise short-term compliance over long-term safety culture, leading to unintended consequences, by inadvertently discourage workers from reporting incidents to maintain eligibility for rewards. OSHA, 2018 quoted in Brandhorst and Kluge (2021) that safety incentive programmes can be beneficial for workplace safety, however, they must be carefully structured to avoid discouraging workers from reporting accidents. Supporting concerns raised by Maliha et al., (2021), arguing that incentive programmes may unintentionally encourage unsafe behaviour. If employees realise that engaging in unsafe work practices increases production and, consequently, enhances their chances of receiving rewards, they may be unintentionally motivated to continue such behaviours. Therefore, production incentives must be relevant and aligned with strong safety performance to prevent the reinforcement of hazardous work habits. The suppression of reporting can lead to misleading safety data, ultimately undermining the programmes' intended purpose of achieving a safer work environment. Additionally, the long-term sustainability of these programmes is questioned, as incentives can become perceived as entitlements, making discontinuation difficult and potentially leading to dissatisfaction among workers (Ganwar and Goodrum, 2005). Highlight the need for a balanced approach to safety incentives, ensuring they enhance workplace safety without compromising transparency, worker well-being, or ethical integrity.

2.5 Conclusion - Summary and Research Gap

While incentives can effectively promote employee engagement, reinforce safe behaviours, and contribute to a proactive safety culture, concerns regarding underreporting, ethical considerations, and sustainability raise questions about their long-term viability. As previously mentioned, gaps in research and conflicting perspectives on the effectiveness of these programmes highlight the need for further research, particularly regarding their long-term impact on workplace safety culture and whether they create sustainable improvements or temporary compliance. This study aims to build on existing research by critically evaluating the impact and reliability of safety incentives, identifying best practices for their implementation while mitigating potential drawbacks.

3.0 Methodology

3.1 Research Design

This project is in relation to specifically safety incentives in the construction industry. The study adopts a mixed-method research approach, with the questionnaire consisting of nineteen questions, collecting both quantitative and qualitative data. “Mixed methods research is particularly useful when a research question requires a multifaceted approach that can simultaneously explore trends in data and the nuances of individual experiences” (McLeod, 2024, p1). This approach allows for a more comprehensive understanding of the effectiveness of safety incentive programmes in the construction industry.

Furthermore, cross-sectional research design has been implemented to evaluate the effectiveness of safety incentives in reducing workplace incidents and fostering a positive safety culture within the construction industry. This design allows data collection at a single point in time, providing an overview of current practices, effectiveness and challenges associated with safety incentive programmes. The cross-sectional approach is suitable as it provides a snapshot of current safety incentive practices and their impact without requiring long-term tracking (Wang and Cheng, 2020, p 66).

3.2 Data Collection Methods

To gather data, a survey questionnaire was designed using Google Forms, to evaluate the effectiveness of safety incentive programmes within the industry (see Appendix 1). The questionnaire was carefully designed using Google Forms, with a focus on keeping it short and effective. An effort was made to ensure questions were presented in a clear and concise manner to obtain key information relevant to the research objectives.

The study relied primarily on primary data, collected through the questionnaire answered by those within the construction industry. Secondary data, such as published reports, HSE guidance, and previous research on safety incentives, were used to support the findings.

3.3 Sampling Strategy

A combination of convenience, snowball, and purposive sampling methods were utilised. The questionnaire was initially distributed to colleagues within the construction industry, then shared more widely via LinkedIn and professional networks. Participants were encouraged to forward the

survey to others within the construction industry, thereby broadening the sample while maintaining relevance to the research topic.

3.4 Target Population

The target population for this study includes individuals working within the construction industry, specifically those involved in health and safety management and site-level operations. Specifically, the study targets safety professionals (e.g., safety consultants, HSE officers), construction management personnel (e.g., site managers, project managers), and on-site workers (e.g., electricians).

The selection process focused on recruiting participants who have direct experience with safety incentive programmes and workplace safety practices in the construction sector. Participants have been approached through professional networks, industry contacts, and LinkedIn to ensure a relevant and informed sample.

3.5 Piloting the Questionnaire

Prior to full distribution, the questionnaire was piloted with a sample of five participants working across various roles within the construction industry. During the piloting phase, feedback indicated that some questions appeared repetitive, leading to confusion about how to respond, risking inaccurate results due to potential confusion or misinterpretation.

In response to this feedback, the questionnaire was revised to remove irrelevant items, rephrase overlapping questions, and improve the overall flow of the survey. These changes helped to improve the survey, reduce confusion, and ensure more accurate responses in the final data collection.

3.6 Ethical Considerations

All ethical considerations were carefully addressed in the design of this study. The research study does not involve vulnerable participants. Informed consent was obtained from all participants before data collection. The data gathered remains anonymous and confidentiality was ensured, with no personal data collected through the survey. No potential risks or harm were identified for either the participants or the researcher.

3.7 Data Analysis

3.7.1 Inferential Statistical Analysis

In order to analyse statistical data received from the questionnaire, The Statistical Package for the Social Sciences (SPSS) (version 29) software was used to run tests. SPSS enables users to organise, sort and analyse data by enabling the user to quantify data, assign inputs and outputs and run a series of statistical tests. To determine whether there were statistically significant differences in how participants rated the effectiveness of various methods used to communicate safety incentives based on how long they have worked in the industry, a one-way Analysis of Variance (ANOVA) was conducted.

3.7.2 Descriptive statistical analysis

For more descriptive, qualitative responses, statistical software such as SPSS was not appropriate due to the open-ended nature of the data. This analysis was conducted manually by reviewing the response data and calculating basic statistics to identify patterns and overall trends.

3.7.3 Qualitative Data Analysis

For open-ended responses, thematic analysis was employed. This involved familiarisation with the data, coding of key words and phrases, grouping codes into broader themes, and drawing insights based on frequency and context. See Appendix 2 for an example of the coding process and the theme identification matrix.

4.0 Results

A total of 53 participants completed the questionnaire, representing a diverse cross-section of the construction industry, including roles such as EHS Advisors, Health and Safety Consultants, Project Managers and Electricians. Respondents had varying levels of professional experience, with a substantial number (50.9%) having 0-5 years of experiences and 49.1% having between 6-20+ years of experience.

4.1 Inferential Statistics

When comparing the effectiveness of various methods for communicating and implementing safety incentive programmes against the duration individuals have worked within the industry, no statistically significant correlation was found.

A one-way ANOVA was conducted to determine if there were significant differences in communication method preferences based on years of industry experience. The results showed no significant effect of experience on perceived effectiveness across all methods:

- Posters: $p = 0.879$
- Toolbox Talks: $p = 0.215$
- Digital Platforms: $p = 0.542$

These p-values indicate that participants' length of time in the industry did not significantly influence how effective they perceived each method to be. Despite the lack of statistical significance, the overall mean scores suggest that Toolbox Talks were rated as the most effective communication method (mean = 2.53), followed by Digital Platforms (mean = 1.98), and Posters as the least effective (mean = 1.49), as shown in the **figure 2** below.

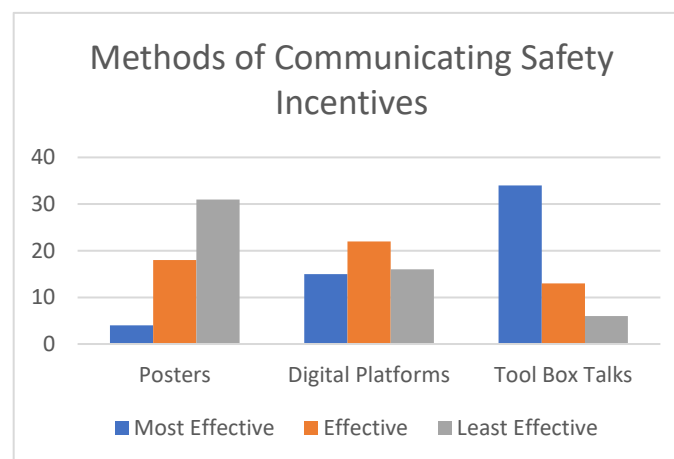


Figure 2: Perceived effectiveness of communication methods

4.2 Descriptive

4.2.1 Programme types and intended outcomes.

Among the 53 participants, behaviour-based safety incentive programmes were reported as the most commonly used, cited by 69.8% of respondents. Near-miss reporting incentives were also frequently implemented, mentioned by 49.1% of participants. Injury or illness-based programmes and peer-to-peer recognition programmes were equally common, each identified by 30.2% of respondents.

In addition to the predefined options, a small number of participants (1.9%) provided responses through the open-ended 'Other' option. A bar chart summarising all types of safety incentive

programmes, including those identified through the open-ended 'Other' option, is provided in Appendix 3

In terms of the types of rewards offered, gift cards were the most commonly reported incentive, selected by 60.4% of respondents. Recognition-based rewards, such as public acknowledgment or certificates, were also highly prevalent, cited by 54.7% of participants. Monetary bonuses and work gear (such as safety equipment or branded clothing) were each identified by 24.5% of participants as common forms of rewards.

4.2.2 Effectiveness on incident reduction, attitudes, engagement

When asked to rate the effectiveness of safety incentives in creating a safer work environment and improving safety culture on a scale from 1 (not effective) to 5 (highly effective), many respondents provided positive ratings. Specifically, 43.4% of participants rated effectiveness as 4, and 26.4% rated it as 5. A further 20.8% gave a moderate rating of 3, while lower ratings were less common, with 3.8% selecting 2 and 5.7% selecting 1.

Similarly, participants were asked their opinion on the effectiveness of safety incentives in reducing workplace incidents on a scale from 1 (not effective) to 5 (highly effective), the highest percent of participants (41.5%) selected the effectiveness as a 4, followed closely behind with the second most popular rating (32.1%) being 3. Participants may not have been fully convinced on its effectiveness with only 17% voting for 5.

Moreover, when participants were asked whether they believed that safety incentive programmes led to long-term improvements in safety behaviour, the majority of participants (75.5%) indicated that they believed the programmes led to lasting improvements. In contrast, 13.2% of participants disagreed, reporting that they did not believe the programmes had a lasting effect. Additionally, a portion of respondents provided further insights through open-ended comments, offering a range of perspectives on the topic. See Appendix 4 for the full list of comments.

Participants were asked a series of questions to understand their attitudes toward safety incentive programmes and their impact on safety behaviours and engagement. When asked whether they believed safety incentives encouraged employee engagement, a considerable proportion (83%) of participants agreed, while 9.4% disagreed and 7.5% of people were unsure.

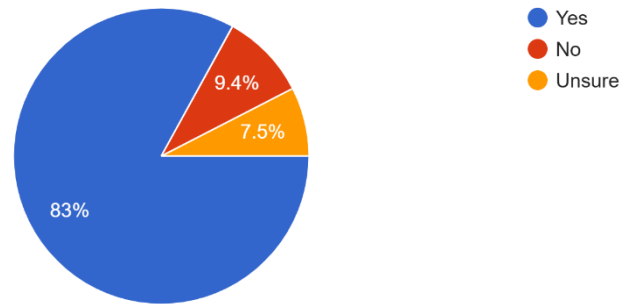


Figure 3: Do incentives encourage employee engagement?

Regarding the programme's impact on employee motivation to adhere to safety standards, 75.5% of respondents indicated that safety incentives were effective in motivating workers to comply with safety guidelines. Conversely, 9.4% disagreed with the notion that incentives played a motivating role, and 15.1% were unsure.

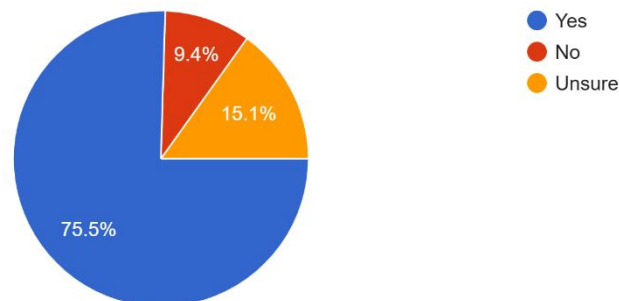


Figure 4: Do incentives motivate workers to adhere to safety standards?

When exploring the factors that influence participation in safety incentive programmes, a sizeable portion of respondents (71.7%) indicated that management support was a crucial factor in their decision to engage with these programmes. Peer influence was also important for 49.1% of participants, while 45.3% cited the clarity of rewards as a key motivator. Additionally, 50.9% of respondents noted that personal safety concerns played a role in encouraging their participation, highlighting the direct impact of individual safety awareness.

In addition to the multiple-choice options, participants provided open-ended responses to further explain what influenced their participation. Interestingly, a few participants pointed out that they believe social media recognition plays a significant role in contractors' decisions to participate in these programmes. Further comments are provided in Appendix 5.

4.2.3 Identifying drawbacks.

When asked about potential negative outcomes of safety incentives, 34% of participants indicated that such programmes could lead to falsifying reports, while 32.1% believed they might result in under-reporting of incidents. In contrast, 24.5% of respondents felt there were no negative outcomes, with only 2% believing that safety incentives could encourage risk-taking behaviour. When asked if participants had any further opinions or comments on safety incentive programmes a participant stated, *"to many times I have seen Safety Incentive programmes been hijacked by Construction Managers to incentivize workers to do longer hours or complete tasks in a shorter duration than was expected..."*

4.3 Thematic Analysis

A thematic analysis of open-ended responses on the benefits of implementing safety incentive programmes revealed three main themes: Improved Involvement and Engagement, Increased Safety Awareness, and Accident Prevention and Safety Improvement. A smaller group of respondents also highlighted how they contribute to a positive safety culture. See Appendix 6 for all thematic comments.

4.3.1 Accident Prevention and Safety Improvement

Participants widely viewed safety incentive programmes as beneficial in preventing accidents and enhancing site safety performance. They described reductions in unsafe acts, workplace injuries, and near misses, with incentives encouraging greater adherence to procedures and improved reporting of incidents.

Typical comments included:

- "Reduce the unsafe acts."
- "Reducing workplace injuries."
- "Stops incidents from occurring."

One participant elaborated:

"Encourages all workers to adhere to the safety procedures that have been put in place to ensure that we all get home safe every day... it has nullified silly mistakes and carelessness."

4.3.2 Improved Involvement and Engagement

Another key theme was improved workforce engagement with safety matters. Respondents indicated that incentive programmes fostered stronger relationships between management and staff, motivated greater participation, and encouraged competition to maintain high standards.

Sample comments:

- "Encourages people to get involved."
- "You might get buy-in from people who wouldn't ordinarily be involved in safety."
- "Better engagement between management and workforce, and more competition to be the top contractor."

Additionally, many highlighted the role of employee support, team ownership, and enhanced communication.

4.3.3 Increased Safety Awareness

Many respondents highlighted a key benefit of the programmes being that they lead to an increased awareness of safety.

Typical comments:

- "Gets operatives thinking about safety more and increases awareness."
- "People pay more attention to safety instructions."
- "Front of mind"
- "A reminder to the men on the ground of simple things that can happen on site that can cause accidents."

4.4 Suggestions for Improvement

Moreover, participants were asked how safety incentive programmes could be improved to ensure long-term safety benefits. Following thematic analysis, six main themes were identified:

Management Support, Communication and Engagement, Incentive Structure and Type, Training and

Awareness and Reporting and Accountability. The most common theme identified was the need to improve the structure and type of incentives.

Comments included:

- “Keep consistency through it all.”
- “More rewards for safe practice”
- “Non-Monetary incentives...Offer extra time off, lunch voucher or lunches with leadership, recognition, or even development opportunities...Rotate incentives so they do not become stale. People are more engaged when they co-create the incentives. Use feedback to adjust the programme over time...Make safety part of how people think and act, not just something they are told to do.”

Further participant comments relating to the other identified themes are provided in Appendix 7.

5.0 Discussion

This study aimed to examine the impact and reliability of safety incentive programmes on health and safety performance in the construction industry. Analysing both quantitative and qualitative data, the findings provide valuable insights and opinions into the types of incentive programmes used, their effectiveness, and the complications surrounding how they are implemented.

5.1 Effectiveness of Incentive Programmes

In terms of effectiveness, the majority of respondents rated safety incentive programmes as moderately to highly effective in both reducing workplace incidents and improving workplace safety culture, particularly in relation to creating a safer work environment and influencing safety culture. Similarly, while fewer participants rated incentives as highly effective in reducing workplace incidents, 73.6% still saw them as moderately to highly effective (ratings of 3 or 4). The survey results suggest some scepticism among participants, particularly regarding the direct impact of incentives on incident reduction. This may be due to participants believing that incentives work best when integrated into a broader Health and Safety Management System. As one participant stated, incentives should be *“backed up with effective training and consistent awareness programmes.”* Aligning with the key principles outlined by HSE (2013), in HSG48, HSG65, which highlights the importance and need for leadership, training, and worker involvement. Therefore, while not a standalone solution, safety incentives can be a valuable tool when used alongside other key safety management practices. This is further echoed by Maliha et al. (2021) who reiterated the need for

education and training to complement incentive schemes to enhance hazard awareness and reduce the number of incidents.

The high ratings in terms of effectiveness in reducing accidents and incidents supports The Reinforcement Theory (Amutan, 2014) by showing that external rewards can reinforce desired behaviours. Furthermore, 75.5% of participants believed the effects of incentives continued after the programme's conclusion, indicating potential for long-term behavioural change, which has been questioned in previous research (Ganwar and Goodrum, 2005). One participant noted, *"Through incentives that encourage us to complete tasks with the correct health and safety measures, we will gradually fall into the habit of it, and it will simply become second nature...."* This comment reflects how reinforcement, especially during the preliminary stages of change, is critical to behavioural change. The participant also stressed that *"the biggest challenge is the first change of these rules... if we do not have strong incentives for the first 3–4 weeks of change it won't change how tasks are carried out,"*

Inferential analysis via one-way ANOVA did not show a statistically significant relationship between years of industry experience and perceptions of the effectiveness of communication/distribution methods of the programmes. The ANOVA results suggests that attitudes toward incentive communication methods are stable across experience levels, potentially indicating an accepted approach across the workforce. Nonetheless, toolbox talks were still rated as the most effective method overall. While there is limited literature linking toolbox talks to the implementation and communication of incentive schemes specifically, this finding reinforces the importance of face-to-face, discussion-based communication in promoting engagement. This reflects findings from Abeje and Luo (2023), who found that organisations prioritising safety and actively engaging employees in safety-related activities, such as incentive programmes, experience improvements in overall safety culture and performance. Such findings echo in participant feedback, with one respondent emphasising, *"Human to human communication needed. Too many rely on digital information, and it doesn't reach all people,"* highlighting their opinion of digital platforms as a limitation in effectively engaging the entire workforce.

Participants also reported prominent levels of agreement regarding the positive influence of safety incentives on engagement (83%) and motivation (75.5%) in relation to safety. Firstly, this reflects findings from previous studies, including Choong Yu'Hui et al. (2012) who found a significant positive correlation between monetary incentives and employee engagement. Moreover, the high agreement among participants regarding the motivational value of safety incentives aligns with the framework previously mentioned by Pretorius (2021), with the model illustrating how, incentive strategies can

impact motivation leading to a further impact on employee performance. Reinforcing the idea that incentives play a critical role in motivation and positive safety performance.

Moreover, when asked about benefits of safety incentive programmes a popular reoccurring theme identified included how they lead to an increase in awareness, aligning with existing literature by Wachter and Yorio (2014), expressing how incentives programmes help to get individuals involved making them more aware of their actions leading to positive safety outcomes.

In terms of the type of safety incentive programmes within construction, most questionnaire respondents noted that behavioural based incentives were most common (69.8%) in their workplace. Aligning with the findings of Lee and Kim (2024) who distinguish between two main types of safety incentive programmes but highlighting how Behavioural Based Safety Incentive Programmes are more effective in construction in comparison to Outcome Based Safety Incentive Programmes i.e. injury/illness based. The prevalence of behavioural focused incentives in the present study reinforces the view that encouraging observable safety behaviours is essential in mitigating root causes of workplace accidents.

5.2 Drawbacks and Ethical Considerations

Despite the positive perception of incentive programmes, the study also noted concerns. A significant proportion of respondents believed that incentive schemes could lead to falsified reports or under-reported incidents, confirming highlighted concerns in the literature with findings from the OSHA, 2018 cited in Brandhorst and Kluge, (2021). These drawbacks highlight the ethical complication of using incentives as a performance tool in safety-sensitive environments, where data integrity is critical. One participant observed, *"Too many times I have seen Safety Incentive programmes been hijacked by Construction Managers to incentivize workers to do longer hours or complete tasks in a shorter duration than was expected,"* suggesting a misuse of programmes that could compromise both safety and well-being. This aligns with literature warnings that if not carefully designed and monitored, incentive schemes may shift focus from genuine safety engagement to performance pressures (Maliha et al., 2021).

With open-ended comments highlighting that they believe social media recognition plays a significant role in contractors' decisions to participate in these programmes. This point highlights concern, as if contractors are only interested in running these programmes to appear compliant or gain public recognition, the programmes may not be carefully and effectively implemented, therefore reducing the chance of them being effective in leading to safety improvements.

5.3 Influencing Factors and Qualitative Insights

The main factors influencing participation included management support (71.7%) and peer influence (49.1). Reiterating HSG65's emphasis on leadership and communication in driving health and safety improvements. From asking opinions on the benefits of the implementation of incentives, findings suggested that the structure and type of incentive is important participants highlighting the importance of rewards for safe practise reiterates the importance of behaviour incentives to help to shape individuals' behaviours in relation to safety supported by the reinforcement theory mentioned in literature. Furthermore, the participants suggesting the need for consistency to ensure that programmes are effective, supports concerns raised by Cox and Jones (2006), in relation to safety related behavioural changes diminishing as programmes end.

6.0 Limitations of the Study

While this study offers valuable insights into the effectiveness and perceptions of safety incentive programmes in the construction industry, several limitations should be acknowledged. The sample was limited in size and may not fully represent the wider construction industry, with only 53 participants.

Another potential limitation to consider is that many respondents were safety professionals within the industry, which may have introduced respondent bias. As a result, there may be gaps in opinions from professionals in other roles within the industry, such as site managers, engineers, or workers, who might view safety incentives differently.

Furthermore, some identified themes from participant comments (e.g. improved safety awareness) were not deeply explored in the original literature review. This limits the opportunity to compare existing theory and new findings.

Additionally, the design of the questionnaire limited the ability to compare certain demographic variables, such as job role, with participants' opinions, which could have offered valuable insights and improved the analysis.

8.0 Conclusion and recommendations

The aims and objectives of this study were successfully met, with all three of the objectives addressed by gathering and analysing a range of qualitative and quantitative data through the questionnaire. Exploring the types of incentive programmes used, addressing the perceptions of their effectiveness, identified potential drawbacks and provided insights into their long-term sustainability.

Findings indicated that while safety incentive programmes are generally positively perceived, particularly in relation to engagement, motivation and safety culture, their impact on reducing incidents remains a subject of scepticism. These results suggest that while the research objectives were met, there remains room for improvement in both the design and implementation of safety incentives within the industry. Recommendations to ensure programmes are effective include maintaining consistency, conducting regular reviews, and successfully integrating them into broader health and safety strategies.

An area for potential research would be in relation to the long-term sustainability of behaviour change, given the concern raised by both literature and participants that behavioural improvements may fade once incentives are removed, future studies should investigate the long-term sustainability of these programmes. Longitudinal studies could assess whether behaviours persist months or years after incentives stop.

Moreover, due to increased safety awareness emerging strongly as a theme, however, being underdeveloped in the literature, this area presents an opportunity for focused research on how incentives heighten safety awareness.

In conclusion, while safety incentives play a crucial role in promoting engagement and safety culture, their long-term effectiveness and sustainability should be critically examined. Ensuring these programmes are effectively implemented, designed, monitored, and understood in the broader context of health and safety management systems as well as Occupational Safety and Health (OSH), is essential for developing more comprehensive and sustainable safety incentive programmes across industries.

Total Word Count: 5409

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10.0 Appendices

Appendix 1:

28/04/2025, 19:08

Safety Incentives in the Construction Industry

Safety Incentives in the Construction Industry

As part of my final year at Ulster University I am carrying out a research project on safety incentives in the construction industry. The following questionnaire aims to gather opinions on the effectiveness of safety incentives within the industry.

The questions are designed to be answered by anyone working within the construction industry. The survey will take no longer than 5 minutes to complete.

Please note that all information received will remain anonymous and confidential.

If you have any questions or concerns about the survey or the study, please feel free to contact me at Conway-K6@ulster.ac.uk.

Thank you for your participation.

* Indicates required question

1. 1. How many years have you been working within the construction industry? *

Mark only one oval.

- ☐ 0-5 years
☐ 6-10 years
☐ 11-15 years
☐ 16-20 years
☐ 20+ years

2. 2. What is your job role within the construction industry? *

28/04/2025, 19:08

Safety Incentives in the Construction Industry

3. 3. Has your company/site implemented any safety incentive programmes? *

Mark only one oval.

- ☐ Yes
☐ No

4. 4. What type of safety incentive programme is most commonly used at your workplace? *

Check all that apply.

- ☐ Injury/illness-based (eg. injury free milestones)
☐ Behaviour-based (positive safety behaviors)
☐ Near-Miss Reporting Incentives (report near-miss incidents identifying hazards)
☐ Peer-to-Peer Recognition Programmes (nominate colleagues for demonstrating exceptional safety practices)
☐ Other: _____

5. 5. What rewards or incentives are typically offered for safety compliance? *

Check all that apply.

- ☐ Monetary bonuses
☐ Gift cards
☐ Work gear
☐ Recognition
☐ Other: _____

6. What factors do you believe influence participation in safety incentive programmes? *

Check all that apply.

- ☐ Management support
☐ Peer influence
☐ Clarity of rewards
☐ Personal safety concerns

☐ Other: _____

7. Do you believe that safety incentives are effective in creating a safer work environment/good safety culture? *

Mark only one oval.

1 2 3 4 5
 Not ☐ ☐ ☐ ☐ ☐ Highly Effective

8. Do you believe there may be any negative outcomes from safety incentives? *

Mark only one oval.

- ☐ Risk taking behaviour
☐ Falsifying reports
☐ Under Reporting
☐ None

☐ Other: _____

9. Rank in order of effectiveness the below methods of communicating safety incentives. *

Mark only one oval per row.

	Posters	Tool Box Talks	Digital Platforms (App, QR Code)
Most Effective	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Effective	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Least Effective	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. Do you feel that these programmes motivate workers to adhere to safety standards? *

Mark only one oval.

- ☐ Yes
☐ No
☐ Unsure

11. How frequently should safety incentives be distributed to maintain motivation? *

Mark only one oval.

- ☐ Daily
☐ Weekly
☐ Monthly
☐ Quarterly
☐ Annually
☐ Other: _____

12. 12. Do you believe incentives encourage employee engagement? *

Mark only one oval.

- ☐ Yes
☐ No
☐ Unsure

13. 13. Have you noticed any changes in workplace safety culture since the implementation of a safety incentive programme? *

Mark only one oval.

- ☐ Yes
☐ No
☐ Unsure

14. 14. Do you think safety incentive programmes lead to long-term improvements in safety behaviour, even after the programme ends? *

Mark only one oval.

- ☐ Yes
☐ No
☐ Other: _____

15. 15. On a scale of 1-5, how effective do you think safety incentives are in reducing workplace incidents? *

Mark only one oval.

- 1 2 3 4 5
 Not ☐ ☐ ☐ ☐ ☐ Very Effective

16. 16. Have you observed a decrease in workplace accidents since the implementation of safety incentives? *

Mark only one oval.

- ☐ Yes
☐ No
☐ Unsure

17. 17. What do you believe are the biggest benefits of the implementation of safety incentive programmes within the industry? *

18. 18. How could safety incentive programmes be improved to ensure long-term safety benefits? *

19. 19. Do you have any further comments or opinions on safety incentives and their effectiveness? *

Appendix 2: Coding method and Theme examples

Note: All comments are direct quotes from questionnaire responses

Thematic analysis- Coding & Themes Identified

17. What do you believe are the biggest benefits of the implementation of safety incentive programmes within the industry?

Positive Safety Culture

1. Culture- Morale, shows you are also looking for positives instead of just focusing on negatives
2. Culture- Promoting a positive HSE culture among workers.
3. Culture -Strong safety culture
4. Culture -Building a better culture
5. Culture Moral within the workforce, it will encourage people to report safety issues however to build a good safety culture I believe that people should do it for the right reasons and not for safety incentives
6. Culture Incentives promote a drive to encourage a positive safety culture on site/within a company

Improved involvement and engagement

1. Engagement- Better engagement between management and workforce and more competition to be the top contractor and therefore reduced accident and incident rate.
2. Engagement- Encourages people to get involved.
3. Engagement- You might get buy in from people who wouldn't ordinarily be involved in safety
4. Engagement- engagement with safety rather than negative reviews
5. Engagement- Promotion and engagement
6. Engagement- It helps drive engagement with workforce, which can only help safety performance
7. Engagement- Employee engagement, drive to follow correct practices.
8. Engagement- Employee engagement has improved massively
9. Engagement- Personnel engagement and well being
10. Engagement- Engagement with staff
11. Engagement- Driving engagement and promoting safe behaviours
12. Engagement- Encourages operatives involvement in safety
13. Engagement- Employee support
14. Engagement - Team ownership and buy in.

Increased Safety Awareness

1. Awareness of safety Raising the basic standard of safety requirements and awareness on site.
2. Awareness of safety Gets operatives thinking about safety more and increases awareness.
3. Awareness of safety Safety awareness
4. Awareness of safety people pay more attention to safety instructions
5. Awareness of safety Increases overall site safety awareness
6. Awareness of safety Heightens awareness to problems
7. Awareness of safety More awareness throughout all of site.
8. Awareness of safety Greater knowledge
9. Awareness of safety Front of mind
10. Awareness of safety A reminder to men in the ground of simple things that can happen on site that can cause accidents makes them more cautious of what they are doing and how to avoid it happening to them

Appendix 3:



Other programmes:

“Safety campaigns focused on proactive behaviours.”

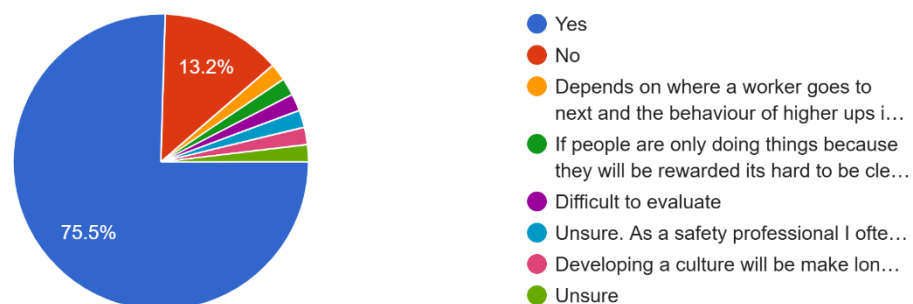
“none”

“Colleague buddying systems”

“Site observation reporting initiatives”

“Bonus schemes tied to safety scores.”

Appendix 4: Opinions on long-term improvements in safety behaviours form incentives



Open Ended Comments:

“Depends on where a worker goes to next and the behaviour of higher ups in a company.”

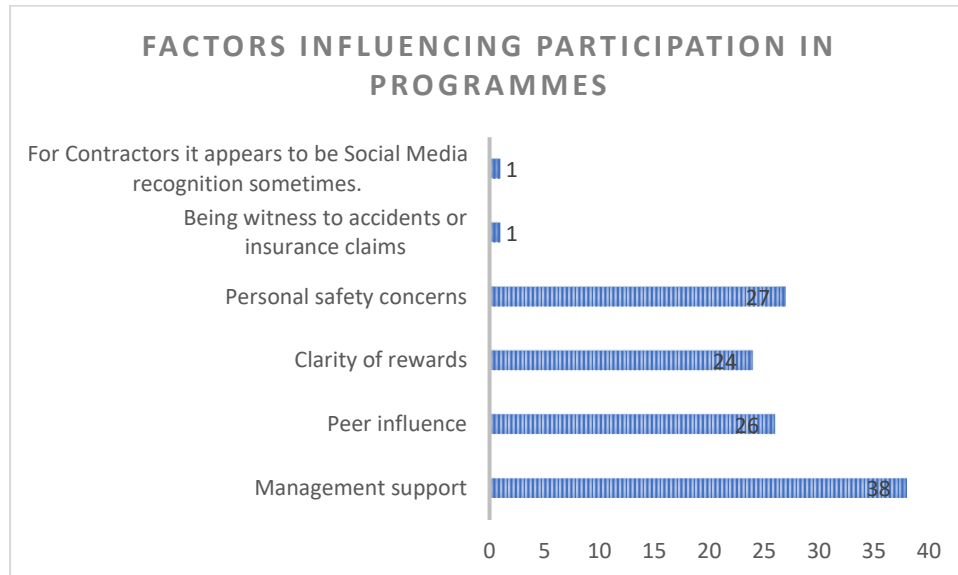
“If people are only doing things because they will be rewarded it's hard to be clear on the improvements.”

“Difficult to evaluate”

“Unsure. As a safety professional I often wonder what ops is saying to the workers on the ground”

“Developing a culture will be make long-term improvements. That being said in my experience it is not about incentives it is understanding and accepting potential human consequences and why we need to work to prevent harm.”

Appendix 5:



Appendix 6:

Example comments include:

Morale, shows you are also looking for positives instead of just focusing on negatives

Promoting a positive HSE culture among workers.

Strong safety culture

Building a better culture

Moral within the workforce, it will encourage people to report safety issues however to build a good safety culture I believe that people should do it for the right reasons and not for safety incentives

Appendix 7:

Thematic Analysis 2

Suggested Improvements for Safety Incentive Programmes

18. How could safety incentive programmes be improved to ensure long-term safety benefits? 53 responses- Comments copied directly from google form responses-

Management Support

Ensure management take it seriously

More encouragement from management

Management support, top-down approach

Greater emphasis coming from site management

Continuous management support

Client engagement

A safety incentive program that HEAVILY impacts the bonuses of Project Directors, Project Managers & Construction Managers would be very interesting. Now a days all of these people are paid bonuses based on Program delivery.

Communication and Engagement

ensure they are communicated well to employees so that they full understand what they are and how they benefit from them.

In my experience more collaboration between workforce and safety auditors and recognise individuals who report without consequences and receiving recognition rather than punishment

More engagement with employees

More interaction with the workforce

Better incentives, engagement with workers to see what incentives they want to see

Talk to people. People matter and so do their opinions

Incentive Structure & type

More rewarding, become a common practise

Keep consistency through it all

Continuous and bonus rewards

programs based into quarterly basis

Have programme over a longer time period

Consistency

Every few months have a full site stand down to reward contractors for following site safety standards

Do them weekly and ask questions about things people have done over the course of the week that changed there perspective of safety in work

Be reward incentivised rather than based on fear of punishment if not reported and adhered to

More rewards for safe practice

System needs to be simple for reporting and not just reliant on someone spotting good behaviour. If larger rewards were offered periodically and subcontractors offered prizes too, would all help

Individual incentives instead of department incentives may improve long term safety

Sometimes the safety incentives is so niche and focused on one aspect that other things are forgotten about, especially when one thing is being driven on site and everyone is focusing on that safety aspect

Change the incentives for example money, to gift cards, tools and clothing etc.

Non-Monetary incentives work- Not everything has to be about bonuses or gift cards. Offer extra time off, lunch voucher or lunches with leadership, recognition, or even development opportunities (e.g., advanced training or site visits). Rotate incentives so they don't become stale. People are more engaged when they co-create the incentives. Use feedback to adjust the programme over time — what works in month one may not work in month six. Make safety part of how people think and act, not just something they're told to do.

Monetary bonuses

more mandatory measures, and better rewards

A buy in from employer and employees with noticeable rewards

Training & Awareness of incentives

Continued awareness training on the benefits of participation

Back them up with effective training and consistent awareness programmes

Knowledge training and education

Let all know about the programme and be motivated

Clarity of incidents and awareness of programmes

Human to humans communication needed. Too many rely on digital information and it doesn't reach all people

Reporting and accountability

SOR's should be read and investigated not just counted for prize winners

Annual review of any issues

Issuing deductions/rewards for not using safety equipment and using

Every worker must report an issue or a positive working practice at least twice a week to ensure the programme is accurate

Minimum 1 safety issue reported by each personal each week

Not sure, maybe an end of year or end of project incentive to try and build up a culture throughout the project

Positive Safety Culture

Through incentives that encourage us to complete tasks with the correct health and safety measures we will gradually fall into the habit of it and it will simply become second nature when completing a task the biggest challenge is the first change of these rules this is when the incentives are required the most so we fall into the habit if we do not have strong incentives for the first 3-4 weeks of change it won't change how tasks are carried out.

Ensuring employees create a positive attitude toward safety and not as a way of getting extra money or prizes

It has the potential to become a habit after incentive finishes

Improve the safety culture on site

Random Opinions

Good practice

Unsure

Linked to charities

Promote t

Not sure.

Yes