

**BEHAVIOUR-BASED SAFETY AND EMPLOYEES' PERFORMANCE IN THE
MANUFACTURING INDUSTRY: A STUDY OF DANGOTE CEMENT, IBESE,
OGUN STATE, NIGERIA**

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ABSTRACT

Organisations cannot compromise safety at the workplace, because in a safe workplace environment lies the intrinsic motivation that propels members of the organisation to give their optimum effort without the fear of incidents that will result into catastrophic accidents. Hence, this study examined the effect of behaviour-based safety on employees' performance in Dangote Cement Plc, Ibesse, Ogun State, Nigeria. The study adopted descriptive research design, with population of study being the entire staff (both permanent and temporary) which is 2,650 employees from which a sample size of 338 employees was drawn. Questionnaire was developed and administered, out of which 276 copies were returned and used for analysis in line with the hypotheses formulated. The result shows that there was a statistically significant effect of behaviour-based safety on employees' performance as all of the indices returned a significant T-values, F-values and p-values, which was enough to reject the null hypotheses formulated. The findings led to the conclusion that as employees embrace more behaviour-based safety through reinforcing safety reactions, and building risk accountability culture, then they tend to increase their productivity and efficiency. In-line with the conclusion, it was therefore recommended that organisations should continue to ensure an environmental culture that fosters behaviour-based safety among others.

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1.0 INTRODUCTION

Safety at the workplace is a fundamental issue to organizational members because it is bordering on factors that propels intrinsic motivation and generates satisfaction, commitment, and drive towards optimization of efficiency and effectiveness (Hofmann, et al., 2017). As much as possible, organizations try to ensure an environment that is safety-driven with policies and procedures that is safety-oriented in nature. All manufacturing organizations adopt safety principles, policies and procedures that ensures that employees not only feel safe but are actually within a safe environment while carrying out their job routing and task on a daily basis (Osei Boakye et al., 2021), because it is not just an obligation to ensure a safe and healthy environment by employers but because in doing so business processes will be devoid of incidents that will disrupt its flow (Esterhuizen & Martins, 2015).

Safety at the workplace does not lie solely at the domain of employers and management of manufacturing companies, because with even with the most safety-driven environment, safety-oriented policies, procedures and processes if employees don't play their part to practice safety at the workplace all of the above mentioned may fail (Zhang, et al., 2023). Workers needs to embrace safety and health as priority at the workplace and they can only achieve this through what is termed behaviour-based safety (Dinagaran, et al., 2019). Making safety behaviour and habit a culture of every member of the organization has no doubt been at the forefront of numerous human resources debate in recent years, no thanks to "Heinrich accident triangle" updated and expanded upon by Bird and Germain in 1985 where they showed the relationship between 3000-5000 many unsafe acts by organization's members resulting in 600 near misses from which 30 minor accidents leading to 10 serious accidents and ultimately 1 death occurs, if not planned, predicted and prevented through timely intervention (Iskamto et al., 2021; Sarmuji & Aryani, 2019; Watoni, 2019).

Performance is synonymous with achieving organizational goals and objectives, and has been described in literature as the catalyst for organization's achieving the strategic reasons for which they are setup (Osagie & Olajide, 2019; Tijani, et al., 2021). Employee's performance is crucial to organizations across the world, irrespective of their size and shape and aligns with the optimal, effective and efficient utilization of resources (Alase, et al., 2021). Achieving optimal performance from employees have been noted to leading organizations to success and cuts across as the fundamental key to objectives actualization (Elegunde & Osagie, 2020). This is because employees have been argued to be the most important or vital of all organization's resources, because without them the usage of all other types of organization resources can never occur (Muda, et al., 2014). Employees' performance in the manufacturing industry in Nigeria, howbeit in a safe and healthy working environment, has been responsible for the success, longevity, growth, amongst other objectives of this industry making it a main stay in the economic development of the country (Osagie, et al., 2019). That is why studying the effect of behaviour-based safety on employees' performance has become a critical issue in modern day Nigerian manufacturing organizations.

Incidents and accidents have been the hallmark of organizations especially those in the

manufacturing industry, this is as a result of the nature of the industry in which its operations rely heavily on the usage of machines and equipment, also the processes and procedures involved in transformation from raw state to desired outputs, the facility layout and the different stages and sections in each type of manufacturing organization based on the nature of their businesses (Hald, 2018). Achieving an incident and accident-free environment has and will continue to be the desire of every employer and management of these organizations, even though their core objective is to maximize profits (Hedlund, et al., 2016), but this desire has somehow eluded them and more often than not they have to set-aside certain funds for such exigencies (Liu, et al., 2015).

Despite all of these, accidents and incidents leading to near fatal or fatal accidents still occur within the facilities as have been noted by the Heinrich Incident Triangle, leading to numerous literature tilting towards a more behaviour-based safety and health practice by members of the organization (Amirah, et al., 2024). These they argue will bring in the desired results, as it is the practical aspect of the policies and procedures that are well implemented that brings about the desired results (Hassan, Ismail & Makhtar, 2020). Managing incidents have been narrowed down to the behaviour of each individual within the organization and not just the sole preserve of the employers or management of the organizations (Idris, Ayob & Shahnen, 2021).

H₀₁: There is no significant effect of reinforcing safety reactions on employees' productivity in Dangote Cement Plc, Ibeshe, Ogun State.

The Nigerian manufacturing industry have been filled with numerous incidents that have resulted in fatal accidents, and there have been issues of reported deaths occurring from one or more of these incidents (Alase, et al., 2021). The failure to ensure safety and health of employees in the manufacturing industries in Nigeria, have led to series of strike actions and closure of some of these manufacturing organizations resulting in loss of man-hours, tensions, reduction in profits, lack of productivity amongst others (Osagie & Olajide, 2019). Avoiding these scenarios have also not been easy because some staff members of the manufacturing organizations in Nigeria have not been effectively following the laid down rules, regulations, standard procedures as instructed by the management, which have constantly been the arguments of employers and management alike. The observation is that some members of the organizations have not fully subscribed to safety policies, fuelling the need for sanctions and punishments (Muda, et al., 2014).

H₀₂: There is no significant effect of building risk accountability culture on employees' efficiency in Dangote Cement Plc, Ibese, Ogun State

The impact of safety on employees' performance cannot be overemphasized, as a conducive environment that is devoid of incidents and accidents have been argued to be among intrinsic factors that propels employees to perform optimally (Alase, et al., 2021; Okonkwo, Okoro & Nwandu, 2015). Hence, the need for this study to examine the effect of behaviour-based safety on employees' performance.

Literature Review

The literature review for this study is done under the conceptual review, the theoretical framework and empirical review, with a conceptual framework embedded to reflect the directional relationships between the variables of interest.

Conceptual Review

Behaviour-Based Safety

The introduction of Behaviour-based approaches in the workplace has mainly originated from the expectation of overcoming the results obtained by traditional methodologies as training and inspection-sanction systems, starting from the observation that knowledge does not necessarily lead to safe actions and that methods like blame and punishment cannot be used too extensively in practice because they worsen the working climate and endanger co-operation within the organization (Passmore, Krauesslar & Avery, 2015). The BBS finds its foundation in the theoretical and scientific principles of Behavioural psychology, a branch of psychology that studies human Behaviour based on what of it is directly observable. The so-called “ABC” three-contingency model was introduced to describe the basis of any Behavioural safety intervention: by manipulating the contingencies A (antecedents) and C (consequences), it is possible to obtain, in fact, any change in terms of frequency, duration, and latency of the Behavioural response B (Spigener, Lyon & McSween, 2022). In standard training instead (when “courses” are treated, generally attended outside of working activity), significant antecedents can be observed (e.g., the content of a presentation or the text of a book) but the consequences (as feedback) are typically scarce. Skinner’s theory of reinforcement” (1938) had a significant influence on Behavioural safety.

A reinforcement occurs when the consequence of a Behaviour makes it more likely that the Behaviour will occur again in the future (Gh, Kandi, et al., 2021). A positive reinforcement motivates an actor to continue expressing a given Behaviour and consists of a pleasant thing or condition as a consequence of his/her act. A negative reinforcement, instead, is the requirement to behave in such a way as to avoid possible consequent dangerous situations. Negative reinforcement strengthens Behaviour by stopping or removing an unpleasant experience. Punishment is different from reinforcement, since it is designed to weaken or eliminate Behaviour rather than to increase it (Aziz, Abdullah & Samsudin, 2021).

The introduction of the term “Behaviour-Based Safety” (BBS) is attributed to E.S. Geller, who coined it in 1979, referring to the use of applied Behaviour analysis methods to achieve continuous improvement in safety performance (Zhang, et al., 2023). With regard to the structure of their implementation, BBS interventions typically consist of the following steps (Dinagaran, et al., 2019).

- i. Analysis of the baseline scenario, where the current safety level (i.e., the safety performance before the Behavioural intervention) is evaluated for a targeted company. To estimate such performance, in-field data on accidents, near accidents, or unsafe Behaviours can be collected by directly observing the workers for a defined timespan; alternatively, those data can be extracted from the accidents or injury records of the investigated company, when available. Typically, the analysis of the baseline scenario also includes the identification of the hazardous tasks to be

- monitored or improved by means of the Behavioural intervention, together with the definition of a target safety performance level.
- ii. Intervention, mainly consisting of providing feedback to the subjects (employees or other company professional profiles) about their safety performance on the targeted items and encouraging them to improve their compliance with safe practices. The presence of observers is still required, in order to carry out Behavioural observations during the intervention phase and the baseline analysis. Awards, training, and the use of checklists are other distinctive points of the method. The number of participants can vary considerably, up to a few hundred, also as a function of the number of sites involved;
 - iii. Analysis of the post-intervention scenario. This step aims to quantify the safety performance of the workplace after the Behavioural intervention, using some specific key performance indicators (KPIs), and to compare it with that of the baseline scenario, to evaluate the resulting improvements. Such a comparison can be supported by an analysis of the statistical significance of the observed outcomes, as long as the number of participants is sufficient, to test if any variation in the safety performance can be attributed to the Behavioural intervention or if it is due to exogenous factors. Whenever such evaluation returns unsatisfactory results, a refinement or change of the intervention could be adopted, otherwise, if the desired targets are reached, the attention could be turned to another set of Behaviours;
 - iv. Eventually, the analysis of a reversal scenario. During the reversal phase, the intervention is withdrawn, and the original working conditions are restored, for investigating whether the improved safety performance can be maintained even when the intervention phase ends during a follow-up period. The reversal phase is relevant, since many researchers are still doubtful about the persistence of results achieved by means of a Behavioural intervention.

Reinforcing Safety Reactions

According to Friend and Kohn (2018), safety programs are documented action plans for identifying and addressing risks, outlining safety responsibilities, and handling emergencies, all with the aim of lowering workplace accidents and incidents. Workplace safety must be considered in all aspects of a business's operations. Employers, employees, and their families all gain when safety precautions are taken since fewer people are hurt, injured, and killed at work (Jilcha & Kitaw, 2017). Proactive and conventional methods are used to manage the safety programs by encouraging everyone in the organization to respond safely. Keeping the workplace safe is a crucial component of being proactive.

According to Darshana (2017), every employee must support safety programs because their objectives are to keep workers safe, reduce risks, and maintain a safe and healthy workplace. Every company operating at a location is required to have a safety program in place. The type of program needed should be determined by the number of employees and the degree of risk they face (Beth, 2018). All parties involved in the workplace must prioritize prevention in order to have a safe working environment. By following safe working practices, a corporation can

save lives and save money, emphasizes safety procedures that will enhance employees' health, well-being, and behaviors, with a particular emphasis on safety rules, concepts, and practices that are based on management's commitment to safety and leadership (Adim & Mezeh, 2020). Employee satisfaction with safety programs and policies, management's dedication to safety, workers' perceptions of work safety, the availability and use of personal protective equipment (PPEs) and plant, handling organizational hazards, and organization-initiated health and safety training programs are some examples.

Building Risk Accountability Culture

The primary and most crucial value that businesses should instil in their working culture is safety. Without safety, a business cannot operate. There is always room for improvement in both personnel productivity and the quality of a company's output. On the other hand, a dangerous and damaging business risk accountability culture can permanently damage its reputation. Safety risk culture may assist companies in making sure that their employees are following more stringent safety guidelines and that any safety issues are being appropriately and promptly addressed by improving incident reporting and providing greater real-time visibility. Employers may find it difficult to improve an organization from the ground up, especially if it requires major or fundamental changes. According to Dessler and Varrkey (2015), workers' safety attitude dictates whether they adhere to current safety protocols and regulations, which in turn affects their productivity and safety. Positive safety attitudes may thereby decrease work interruptions, boost employees' level of job completion, and increase value contributed.

The literature currently available on human resource management (HRM) recognizes aspects of employee safety attitudes and makes an effort to connect them to worker productivity and workplace safety. However, the intervening effect of workplace safety attitudes on the link between workplace safety and employee productivity has not been empirically determined in the literature. Employees with favorable safety attitudes, for example, pay attention to safety training, are aware of safety procedures, and encourage their coworkers to follow them, according to Aswathappa (2015). According to Li et al. (2020), workers that have a negative attitude toward safety disregard safety protocols and incur needless risks. Laura (2019) highlighted that due of unfavorable views about employee safety, accidents and issues with employee productivity may continue even while businesses are committed to establishing safe workplaces and increasing worker productivity. According to Kundu (2016), creating safety programs like safety training and safety control can help overcome negative safety attitudes. According to Lencioni (2019), insufficient safety ergonomics, safety training, and safety transfer to insurance and consultants result in unfavorable safety attitudes like phobias and overconfidence, which cause workers to take needless risks or avoid jobs that are thought to be dangerous. Employee task completion may suffer as a result, and there may be more accidents and less time spent productively. According to Huang et al. (2022), safety training programs, including training audits, safety drills, safety regulations, discussions, and seminars, may eradicate unfavorable safety attitudes, lower the likelihood of accidents, and affect employee productivity.

Employees' Performance

Performance can be defined as the achieved desired results. It is the ability of an organization to fulfill its mission, vision and corporate objectives through sound management, strong governance and a relentless re-dedication to achieving results (Mahapatro, 2010). Organizational performance is used to measure the effectiveness and efficiency of an organization, it involves the recurring activities to establish organizational goals, monitor progress towards these goals, and make adjustments to achieve these goals more effectively and efficiently (Ratna, et al., 2014). Employee performance is determined by the caliber of work they produce and the accomplishment of goals in line with their given responsibilities. According to another study by Genzorová (2017), a successful employee performance is defined as meeting work standards, predefined criteria, targets, and objectives within a given time frame and achieving the intended outcomes both individually and collectively. According to Satyvendra (2019), an employee's performance level is simply defined as their actions while carrying out their designated duties. An action or acts taken by workers in the course of their work to accomplish the organization's goals.

Employees' performance is a collection of their qualities, aptitudes, and talents that they may use when and when necessary to accomplish tasks on schedule and produce the intended results (Mathew & Khann, 2016). Employee performance is defined as the actions and/or behaviors carried out to achieve an organization's goals and objectives (Yingjun, 2019). Job performance is the amount of work that individuals and/or groups do each time to complete tasks that show the caliber of work done to achieve goals (Satyvendra, 2019). This is a crucial element of every organization that has a significant impact on both its long-term viability and success. The physical working environment, standardized operating procedures and policies, the significance of the work completed, the equipment used, the system's reward system (good or bad), performance expectations, performance feedback, skills, knowledge, attitudes, and behaviors are some of the factors that affect an employee's level of performance at work (Okasheh, 2017). Because it can intervene, impede, and/or set limits of the series of work behaviors displayed by employees that may have an impact on the task being performed, the physical working environment is a vast and prominent aspect of the work environment that greatly influences the performance and productivity of the employees.

Employees' Productivity

Productivity, according to Sutrisno (2017), is the relationship between inputs (money, labor, and materials) and output (goods or services). The two components of employee productivity are (a) the output dimension, which includes management effectiveness and the quantity of goods or services produced per unit, and (b) the input dimension, which includes labor, consumable materials, costs, non-consumable equipment, and time spent producing goods and services. In terms of productive attitudes and mentalities including motivation, discipline, creativity, invention, dynamism, professionalism, and financial mindset, productivity is defined as the ratio of results obtained (output) to total resources used (input) (Sedarmayanti, 2011).

Productivity, according to Mathis & Jackson (2012), is the measurement of the amount and caliber of work done while taking resource costs into account. Productivity, according to Phusavat (2013), is the numerical ratio of output generated to input used. While Robbins and Timothy (2012) define productivity as the conversion of inputs into outputs at the lowest cost, Samuelson and Nordhaus (2009) define productivity as output per unit input. According to these beliefs, the ratio of output (goods or services) to input (different resources) can be used to summarize staff productivity. The output dimension, which includes (1) the effectiveness of work results, (2) the added value generated, (3) the quality of work, and (4) the quantity produced, is one of the dimensions of employee productivity. The input dimension, which includes (1) labor, (2) costs, (3) materials and equipment, and (4) organizational factors like management support and programs that support product outcomes, is the other dimension.

2.1.2.2 Employees' Efficiency

Khademfar and Amiri (2013) define efficiency as the capacity to do activities as efficiently as possible. There are two types of efficiency that are commonly discussed: static efficiency and dynamic efficiency. Static efficiency includes things like improving current conditions and refining current items, processes, or possibilities. Efficiency gauges how well inputs are converted into outputs or the relationship between inputs and outputs. Allocating resources among several purposes is the key to efficiency (Kumar & Gulati, 2010). Efficiency is really important when it comes to employee behavior. Only when something is successful can it be considered efficient. To put it another way, something is efficient if it improves the circumstances of the user. It must have the capacity to operate (Noordzij, 2013). Because of this, efficiency can only be discussed after effectiveness has been attained. The ability to act or create successfully while consuming the least amount of waste, money, or needless effort is known as efficiency. "There is, without a doubt, nothing more pointless than putting up considerable effort into something that should not be done at all." One characteristic of an employee is their efficiency, which is linked to how quickly and accurately they finish a given task. It is impossible to ignore the importance of skill management in a business, particularly when it comes to guaranteeing employee efficiency and production. In order to guarantee that their work is finished promptly and effectively, employees must possess the necessary abilities. Having certain skills is necessary to be effective at work; these skills might be managerial, strategic, technical, or conceptual.

Theoretical Framework

The theory that serves best to explain the causal relationship between the variables of interest is the social cognitive theory by Bandura in 1986.

Social-Cognitive Theory

Social Cognitive Theory (SCT) of human behaviour is a psychological study advocated by Bandura (1986) to explain the interrelation between persons, their behavior, and how it affects external environment in a triadic reciprocity model (Mehmood, et al., 2024). The core concept of this theory explained the social-structure factors of reproduction of an observed behavior influenced by the interaction by (a) personal attributes, traits that carried by individual, (b) behavioral, the response an individual carry based on the traits, and (c) external environment,

which refers to outcome or consequences and individual act-based traits carried by the person (Voo, Sochod & Long, 2018). Bandura (1986) explained in SCT that, people are neither driven by inner forces nor automatically controlled by the external factors. People function based on their own contribution for their own motivation, behavior, and development within a network of interest and influences (Ayhan, 2020).

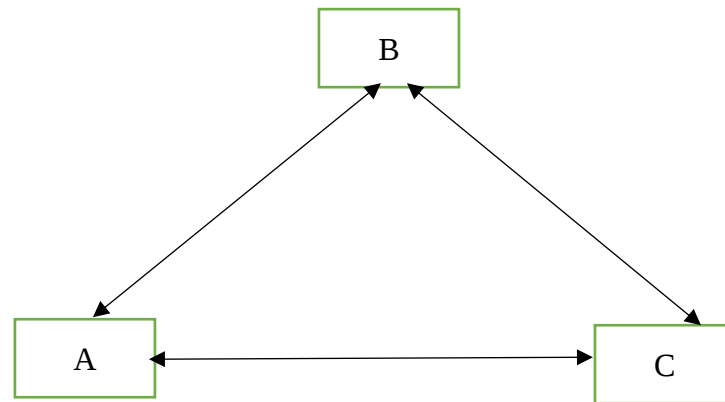


Figure 1. *Social Cognitive Theory* by Bandura (1986)

Figure 1 explained the direction of SCT model. The relationship between A and B reflects the interaction between thought, affect, and action. The way human think, believe, and feel, affects how they behave (Bandura, 2001). Here, the A, which is personal attributes encompasses the biological properties of the organism. B, the behavioral factors are modifiable agent that support personal attributes (Bandura, 2001). The A and C relationship is concerned with the interactive relation between personal attributes and external environment. The way human traits and cognitive competencies act influences the consequences or outcomes in how they behave to their environment (Wang, et al., 2021). The B and C relationship represents the influence between behavior and the environment. Bandura (2001) explained that behavior alters environment conditions. Where the environment is not a fixed entity that inevitably impinges upon individuals. Here, the aspects of the outcomes in external environment do not operate as consequences until appropriate behavior activates them. In other words, the aspect of the potential outcomes to become the actual outcomes for given personal traits thus depends on the behavior carried by the attributes (Voo, Soehod & long, 2018).

SCT explores the distinct processes by which people learn and maintain habits, taking into consideration the social context in which these behaviors emerge. This theory places a strong emphasis on the idea that a person's prior experiences have a significant influence on their propensity to engage in particular activities (Ayhan, 2020). These experiences shape one's expectations, anticipations, and reinforcement mechanisms, and these factors are crucial in determining whether or not a specific behavior will be adopted, as well as the underlying reasons why (Lorenzo, et al., 2016; Ismail & Ali, 2020; Kabir & Rashid, 2019). The primary purpose of SCT is to clarify how people use reinforcement and control mechanisms to carry out goal-directed behaviors that can be maintained over time (Mohammad, 2023).

Empirical Review

Kao (2019) investigated the link between safety knowledge, safety attitudes and safety behaviour. The study collected data from supervisors and workers in construction firms in the United States of America. The study did not show how it conceptualised its constructs. The study found that safety knowledge mediated the relationship between safety attitudes and safety behaviours. The study failed to link workplace safety in terms of safety ergonomics, emergency management, safety training and safety transfer to workplace safety attitudes and employee productivity outcomes as conceptualised in the current study.

Laura (2019) studied the mediation effect of safety climate and safety motivation on the relationship between organisational climate and safety performance. The study used questionnaires to collect data from nurses in two hospitals in Italy. The study conceptualised safety in terms of managerial values and participation in safety training which are partial measures of workplace safety, while the current study measured workplace safety in terms of programmes put in place for safety. The study hypothesis which was evaluated using regression models found that safety climate (attitudes) did not mediate the relationship between organisational climate (work performance) and safety participation (training attendance). The study was conceptualised in a sector different from the current study.

Research on the effectiveness of occupational safety and health management on employee productivity has been reported by (Has & Susanty, 2016; Santiana et al., 2018), with findings indicating that the effectiveness of occupational safety and health management significantly affects employee productivity. Recent research on work productivity has been reported by (Jaafar & Rahim, 2022), who investigated the mediating effects of job autonomy and work-family conflict on the relationship between telecommuting and employee productivity, and by (Kurdy et al., 2023), who studied the mediating effects of job level on the relationship between remote work and employee productivity.

A study by Rosa (2019) investigated safety attitude and its relationship with safety training and generalised work efficacy. The study conceptualised work efficacy as the belief in one's ability to perform a given task, while the current study measures work productivity using three measures (value-added, degree of accomplishment of tasks and productive time). Safety attitudes were conceptualised in terms of perceptions of safety climate, while the current study conceptualised safety attitudes in terms of response to safety programmes. The study failed to show how safety training was conceptualised. The sample was made up of 140 workers from three tile manufacturing firms and one in the public sector in Spain. The regression results found that safety training was positively associated with safety attitude and work efficacy. The study was faulted for collecting data from employees who might have been biased when asked to rank their work efficacy and attitude, while the current study collected data from supervisors and focused on the intervening effect of safety attitude on the relationship between workplace safety and employee productivity

Conceptual Framework

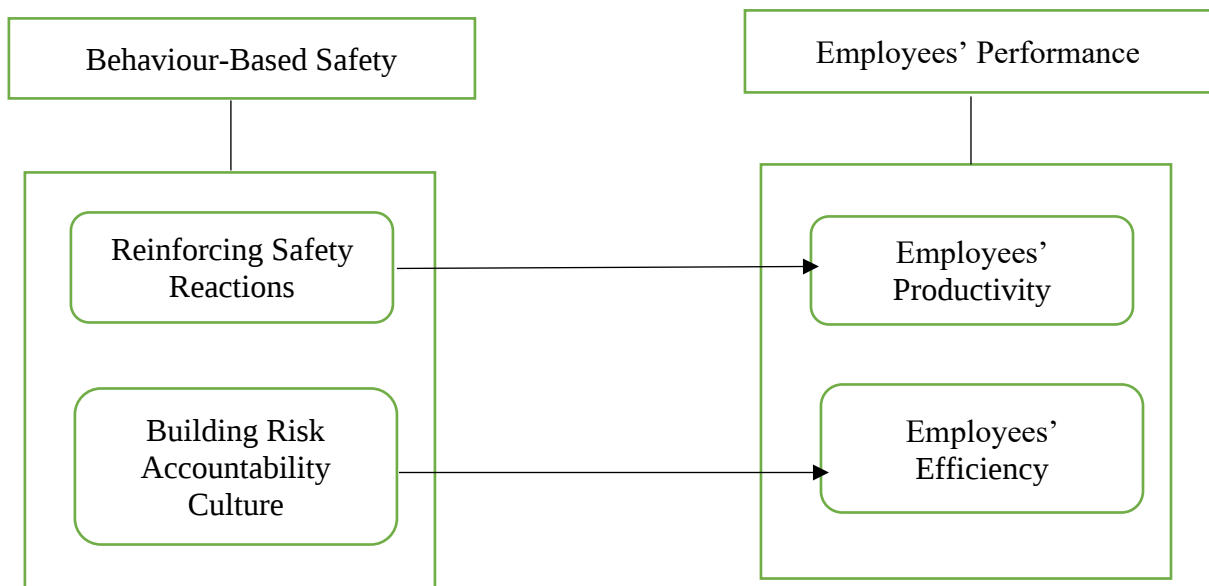


Fig. 1: Conceptual framework

Source: Researcher's Conceptual Model (2026)

Methodology

The study deployed descriptive survey research design to examine the effect of behaviour-based safety on employee's performance in Dangote Cement Plc in Ibese, Ogun State, with the primary aim of gaining an understanding of phenomenon under study, by collecting the needed data through surveys as appropriate for this study (Creswell, 2012).

The study population includes all permanent staff and temporary staff of Dangote Cement Plc situated at Ibese in Yewa North Local Government Area of Ogun State. Using Krejcie and Morgan (1970) sampling size determination table, a sample of three hundred and thirty-eight (338) were drawn from the population of two thousand, six hundred and fifty (2,650). Accidental sampling method was used to select the respondents.

The study utilized questionnaire developed in a 5-point Likert Scale rating, developed as primary source of obtaining data from the study selected respondents ranging from Strongly Agree (5), Agree (4), Undecided (3), Disagree (2) and Strongly Disagree (1). The question item was put through a face and content validity, to ensure that they were valid representation of what the study intended to capture by the supervisors and other professors in the department of Industrial Relations & Human Resource Management. Thereafter, the questionnaire was tested using test-retest method and reliability conducted to obtain internal consistency through Cronbach-Alpha, with a coefficient of 0.83 and 0.74 was obtained for the independent variable, construct items respectively, while the dependent variable's construct items returned 0.76 and 0.78 reliability coefficient respectively.

The copies of the questionnaire were administered personally by the researcher with the help of four (4) experienced research assistants because the premises of the company is big and work schedule of the participants was too tight. A total of three hundred and thirty-eight (338)

copies of questionnaire were administered, out of which 287 copies were retrieved but only 276 copies representing 81.65% were certified valid for final analysis. Data were analyzed using simple regression on Statistical Package for Social Sciences (SPSS) version 27 at 0.05 level of significance.

Hypotheses Testing and Discussion of Findings

Table 1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.340 ^a	.116	.112	.781

a. Predictors: (Constant), Reinforcing Safety Reactions

Source: Author's computation, (2025)

Table 2: ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17.558	1	17.558	28.796	.000 ^b
	Residual	134.140	274	.610		
	Total	151.698	275			

a. Dependent Variable: Employees' Productivity

b. Predictors: (Constant), Reinforcing Safety Reactions

Source: Author's computation (2026).

Table 3: Coefficient

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.185	.147		8.046	.000
	Reinforcing Safety Reactions	.385	.072	.340	5.366	.000

a. Dependent Variable: Employees' Productivity

Source: Author's computation (2026).

The model summary table in hypothesis one above revealed a R value of 0.340 which is the association between the independent variable (reinforcing safety reactions) and the dependent variable (employees' productivity) as can be explained by the model. It also revealed an R² value of 0.116, which is the degree of variation resulting from the association of the IV and the

DV. It implies that every unit of reinforcing safety reactions in Dangote Cement Plc, Ibese, Ogun State results in a concurrent variation of 11.6% in employees' productivity, with other variables outside the model accounting for the remaining 88.4%.

The ANOVA table reveals a F_{Stat} value of 28.796 with a p-value of $0.000 < 0.05$ indicating that the independent variable (reinforcing safety reactions) significantly predicts the outcome of the dependent variable (employees' productivity). The implication is that reinforcing safety reactions has a significant effect on the outcome of employees' productivity in Dangote Cement Plc, Ibese, Ogun State.

The Coefficient table above revealed the importance of the T-statistics of 5.366 which shows a significant deviation from the null hypothesis, with a p-value of $0.000 < 0.05$, enough to reject the null hypothesis and assert that "reinforcing safety reactions has a significant effect on employees' productivity in Dangote Cement Plc, Ibese, Ogun State.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.745 ^a	.554	.553	.800

a. Predictors: (Constant), Building Risk Accountability Culture

Source: Author's computation, (2026)

Table 5: ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	299.196	1	299.196	467.951	.000 ^b
	Residual	240.405	274	.639		
	Total	539.601	275			

a. Dependent Variable: Employees' Efficiency.

b. Predictors: (Constant), Building Risk Accountability Culture

Source: Author's computation, (2026)

Table 6: Coefficient

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.961	.088		10.865	.000
	Building Risk Accountability Culture	.662	.031	.745	21.632	.000

a. Dependent Variable: Employees' Efficiency

Source: Author's computation (2026)

The model summary table in hypothesis one above revealed a R value of 0.745 which is the

association between the independent variable (building risk accountability culture) and the dependent variable (employees' efficiency) as can be explained by the model. It also revealed an R^2 value of 0.554, which is the degree of variation resulting from the association of the IV and the DV. It implies that every unit of building risk accountability culture in Dangote Cement Plc, Ibesse, Ogun State results in a concurrent variation of 55.4% in employees' efficiency, with other variables outside the model accounting for the remaining 44.6%.

The ANOVA table reveals a F_{Stat} value of 467.951 with a p-value of $0.000 < 0.05$ indicating that the independent variable (building risk accountability culture) significantly predicts the outcome of the dependent variable (employees' efficiency). The implication is that building risk accountability culture has a significant effect on the outcome of employees' efficiency in Dangote Cement Plc, Ibesse, Ogun State.

The Coefficient table above revealed the importance of the T-statistics of 21.632 which shows a significant deviation from the null hypothesis, with a p-value of $0.000 < 0.05$, enough to reject the null hypothesis and assert that "building risk accountability culture has a significant effect on employees' efficiency in Dangote Cement Plc, Ibesse, Ogun State.

Discussion of Findings

The result of hypothesis one revealed that reinforcing safety reactions has a significant effect of employees' productivity in Dangote Cement Plc, Ibesse, Ogun State. This implies that there is a statistically significant effect of reinforcing safety reactions on employees' productivity with a R^2 value of 0.116 and a p-value of $0.000 < 0.05$. Hence, every effort by the employers or management of Dangote Cement Plc, Ibesse, Ogun State results in a 11.6% increase in employees' productivity. This finding is synonymous with the findings of Has and Susanty, (2016) and Santiana et al., (2018), who found that the effectiveness of occupational safety and health management significantly affects employee productivity.

Hypothesis two revealed that building a risk accountability culture has a significant effect of employees' efficiency in Dangote Cement Plc, Ibesse, Ogun State, with a R^2 value of 0.554 and a p-value of $0.000 < 0.05$, implying that has Dangote Cement Plc continue to build a culture of risk accountability among their staff members, it will result in 55.4% of employees' efficiency for the organization. This finding is synonymous with the findings of by Rosa (2019) who investigated safety attitude and its relationship with safety training and generalised work efficacy. The results found that safety training was positively associated with safety attitude and work efficacy and as such helps to buttress the outcome of this particular study.

The theoretical findings of social cognitive theory revealed that the processes by which people learn and maintain habits, taking into consideration the social context in which these learning behaviors emerge have a significant influence on their propensity to engage in particular activities such as behavior-based safety at the workplace (Ayhan, 2020). These experiences shape the individual's expectations, anticipations, and reinforcement mechanisms, and these factors are crucial in determining whether or not behavior-based safety will be adopted, as well as the underlying reasons for accepting it.

Conclusion

The study concluded based on the results obtained from the data analysed that behaviour-based safety has a significant effect on employees' performance in manufacturing industry in Nigeria

based on the outcome of the findings, which are that reinforcing safety reactions leads to improved employees' productivity, and that building a risk accountability culture results in increased employees' efficiency in Dangote Cement Plc, Ibese, Ogun State. This is because all the indices used to analyse the data were enough to reject the null hypotheses formulated and allowed for the assertion above, hence the conclusion.

Recommendations

Based on the conclusion reached above, the following recommendations were made:

- i. Manufacturing companies should endeavour to improve on the enforcement of reinforcing safety reactions policies, as this will ultimately lead to improve employees' productivity as a result of less incidents and accidents
- ii. Manufacturing companies should ensure that they build a risk accountability culture where they have none, or ensure that employees embrace such culture more where it is already in existence. This is because when such culture is built and embraced, efficiency in carrying out task increases.

Suggestion for Further Studies

Further studies could be carried out on studying the effect of behaviour-based safety on employees' performance in other sectors aside the manufacturing industry, as there are also incidents and accident-related issues prevalent in these sectors as well.

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