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ENHANCING SAFETY MANAGEMENT AND BOOSTING PRODUCTIVITY IN PLASTIC MANUFACTURING FIRMS IN NNEWI NORTH, ANAMBRA STATE, NIGERIA.

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Abstract

This study examined the influence of safety management on productivity enhancement within plastic manufacturing firms in Nnewi North, Anambra State. Specifically, it aimed to investigate the effects of safety culture on employee attitudes; the role of safety training in driving revenue growth; and the impact of management's adherence to safety policies on employee performance. A review of relevant conceptual, theoretical, and empirical literature was conducted, with the study grounded in game theory. Using a descriptive survey research design, the research focused on a population of 420 employees at Afro-Asia Automobile & Plastic Limited in Otolo Nnewi. Data collection was carried out through questionnaires, and the results were analyzed employing descriptive statistics and simple linear regression techniques. The findings revealed that safety culture positively and significantly influenced employee attitudes in plastic manufacturing firms. Additionally, safety training was found to have a significant positive effect on revenue growth, while compliance with safety policies by management significantly improved employee performance. The study concludes that safety management substantially contributes to productivity enhancement in plastic manufacturing firms within Nnewi North LGA. Recommendations include that management should regularly provide training for employees on the proper use of tools and safe task execution in the factory to minimize the risk of hazards.

Key Words: Safety Management, Productivity, Hazard, Accident, Anambra State

1.1 Introduction

In today's world, organizations are continually improving their production methods, which is one reason they invest in advanced technology to enhance their productivity (Riaño-Casallas & Tompa, 2018). Safety management has become a global concern, as it promotes the well-being of the workforce in any nation and contributes to national development (Reuben, Ismail, Ahmad, Maina & Daud, 2019). Matters of safety and health are crucial across all areas of human endeavor, including business, information technology, recreational facilities, and even domestic activities (Kolawole & Opaleye, 2023).

Given the significant impact of safety management on a nation's economy and overall development, alongside the challenges it presents (Hallowell, Bhandari & Alruqi, 2019), this issue has garnered the attention of numerous stakeholders, including researchers, management of work systems, and government agencies (Abubakar, 2015).

In nearly every country, safety is a priority, and efforts are being made to ensure the well-being of employees in the workplace (Manu, Poghosyan, Mshelia, IIwo, Mahamadu & Dziekonski, 2019). The importance of safety cannot be overstated, nor can that of productivity. Work, as noted by Charles-Owaba (2010), is essential for any nation's development, serving as the bridge between human aspirations and their fulfillment. Therefore, meaningful development cannot occur without work. Eurofound (2015) stated that health and safety encompass not just the prevention of accidents and diseases, but also every aspect of workers' comfort. To achieve a healthy and safe work environment that increases productivity, there must be a concerted effort to implement effective health and safety programs (Omoijiade, 2019). Avoiding injuries, discomfort, and fatalities, along with minimizing financial burdens on employees, their families, and employers, are major concerns of health and safety programs.

The safety ordinance of 1955 marked the Nigerian government's first attempt to regulate industrial organizations, with further progress in Occupational Safety and Health (OSH) legislation during the 1970s (Fuller 2019; Simukonda et al, 2020). The principal statute regulating OSH in Nigeria is the Factory Act of 2004 (OSHP 2004), while the Employees Compensation Act of 2010 addresses employee compensation for work-related injuries. The Labour, Safety, Health and Welfare Bill of 2012 aims to repeal the Factory Act of 2004, having been passed by the national parliamentary assemblies (Okoye, Ezeokonkwo & Ezeokoli 2016). However, enforcement of OSH laws remains inadequate in Nigeria (Idoro, 2011).Kolawole and Opaleye (2023) noted that effective safety management can significantly reduce absenteeism due to musculoskeletal disorders (Umeokafor et al. 2020) and boost productivity by creating a more conducive work environment (Nkuhi & Benjamin 2020; Udodiugwu et al. 2025). Reports indicate that Nigerian workers are increasingly susceptible to accidents, leading to serious injuries or fatalities (Bamel, Pandey & Gupta, 2020). Unfortunately, workplace safety, once prioritized by employers, is now often neglected.

According to Onwudiwe, Agwamba, Ugwuegbu, and Opara (2018), a particularly harrowing incident in industrial safety occurred in 2002 when a plastic factory in Ikorodu, Lagos, was engulfed in flames. This tragic event resulted in the loss of numerous lives, as many workers were trapped inside the factory due to the negligent actions of the Chinese owners, who had intentionally locked the employees in and retired to their heavily fortified residence, protected by armed policemen (Wogu, 2011). Karanikas, Melis, and Kourousis (2018) have highlighted a crucial correlation between employee satisfaction and workplace safety. They argue that when workers feel secure and content with their working conditions, their productivity significantly increases. Thus, there is an imperative to delve deeper into the relationship between effective safety management practices and the enhancement of productivity within industrial settings.

This study was meticulously designed to investigate the profound impact of safety management on productivity improvement specifically within plastic manufacturing firms located in Nnewi North, Anambra State, Nigeria. By examining safety protocols, workers' perceptions of their environments, and the subsequent effects on productivity, this research aims to provide valuable insights that could lead to better safety regulations and ultimately foster a more productive workforce.

1.2 Statement of the Problem

The manufacturing sector in Nigeria has continued to experience a high rate of accidents, with a total of 3,183 reported injuries between 1987 and 1996, of which 71 (2.2%) were fatal (Victor, 2013; Kidd, 2020; Simukonda et al., 2020; Supriyatna, Kurniawan & Purba, 2020). Additionally, a report presented to the national Occupational Safety and Health (OSH) information center indicated that there were 490 industrial accidents in Nigeria from 2001 to 2006. Further analysis by Umeokafor et al. (2014) revealed that the food processing sector accounted for 60% of all fatal accidents between 2002 and 2012, highlighting significant safety concerns in this industry.

The implications of inadequate employee protection can adversely affect organizational performance. When employees feel unsafe, their motivation and productivity may decline. Resources that could have been allocated to employee development, incentives, or business expansion may instead be diverted to cover medical expenses, temporary workers' wages, and legal liabilities, ultimately affecting productivity.

In the construction industry, poor safety performance is a prominent global challenge (Chan et al., 2023). In China, construction-related incidents account for over one-third of all industrial accidents annually (Choi et al., 2019; NBS, 2019). Dorji and Hadikusumo (2006) argue that an effective safety system must begin with a strong policy framework. A clearly defined safety policy is essential for the establishment and implementation of a safety management system in the workplace. The expected outcomes of such a system include a reduction in accidents, injuries, sick pay, fatalities, lost work hours, compensation claims, absenteeism, and improved efficiency and profitability (Olutuase, 2014).

There is a prevailing viewpoint among some experts, such as Emma-Ochu, Okolie, and Ohaedeghasi (2021), that while accidents in the workplace may be perceived as unavoidable, many incidents could actually be prevented through appropriate safety measures. Similarly, Idubor and Oisamoje (2013) suggest that some individuals equate workplace accidents to divine intervention, leading to a potentially lax attitude toward safety protocols. This mindset may result in contractors neglecting necessary prevention measures and disregarding safety guidelines altogether.

Furthermore, various factors influence compliance with OSH regulations in the construction industry across Africa. These include stakeholders' perceptions that compliance is costly and time-consuming, insufficient training of staff, lack of commitment from key players in the construction sector, high levels of unemployment, neglect of human rights and ethical practices, as well as the absence of a robust safety culture (Umeokafor, 2017;

Okoye et al., 2016). Addressing these issues is crucial for the effective enforcement of health and safety regulations, making the establishment of functional health and safety programs essential.

1.3 Research Questions

The following research questions were formulated to guide the study;

1. What is the impact of safety culture on employees' attitude of plastic manufacturing firms in Nnewi North, Anambra State, Nigeria?
2. To what extent does safety training impact on the revenue growth of plastic manufacturing firms in Nnewi North, Anambra State, Nigeria?
3. To what degree does management compliance to safety policies impact on the employees' performance of plastic manufacturing firms in Nnewi North, Anambra State, Nigeria?

1.4 Hypotheses

Consequent upon the stated objectives and research questions, the following null hypotheses was formulated for the study;

$H0_1$: There is no significant impact of safety culture on employees' attitude of plastic manufacturing firms in Nnewi North, Anambra State, Nigeria.

$H0_2$: There is no significant impact of safety training on the revenue growth of plastic manufacturing firms in Nnewi North, Anambra State, Nigeria.

$H0_3$: There is no significant impact of management compliance to safety policies on the employees' performance of plastic manufacturing firms in Nnewi North, Anambra State, Nigeria.

2.0 Review of Related Literature

2.1 Safety Management

A safety management system (SMS) is intended to oversee safety risks in the workplace, with occupational safety being characterized as the minimization of risk to a level that is as low as feasibly possible to avoid injuries (Beus, Payne, Bergman, and Arthur, 2010). An SMS offers a structured approach to consistently identify and monitor hazards and manage risks while ensuring that these risk control measures are effective. Safety management can be described as: a methodical approach to safety. It is a systematic, explicit, and all-encompassing process for handling safety risks. Like all management systems, a safety management system includes goal setting, planning, and performance measurement (Bosompem & Mensah, 2012). A safety management system is integrated into the very core of an organization, becoming part of the organizational culture and the way employees perform their tasks.

Safety management serves as an organizational function that guarantees the identification, assessment, and adequate mitigation of all safety risks. It is generally understood as employing a framework of principles, processes, and measures to avert accidents, injuries, and other negative outcomes that might arise from the use of a service or product (Skyguide, 2021). This function aids managers in fulfilling their duties related to operational system design and implementation by anticipating system deficiencies before mistakes occur or pinpointing and remedying these deficiencies through professional analysis of safety incidents. Safety management indicates a systematic strategy for handling safety, encompassing the necessary organizational

structure, responsibilities, policies, and procedures.

There are three key reasons to implement a safety management system within a business: ethical, legal, and financial. Bronkhorst (2015) emphasizes that employers have a moral obligation to ensure the safety of work activities and the work environment; every jurisdiction has legal stipulations that outline how this should be implemented, and substantial evidence exists demonstrating that effective safety management can lessen financial risks (Rubin, Giacomini, Allen, Turner & Kelly, 2020) and protect an organization's reputation by decreasing accidents (Clarke, 2013). Work-related fatalities, injuries, and illnesses impose a particularly severe burden in developing countries, where numerous workers are involved in dangerous jobs such as agriculture, construction, logging, fishing, and mining (Curcuruto, Conchie, Mariani & Violante, 2015).

2.2 Productivity

It can be asserted that when an employee is enthusiastically engaged in their work, it indicates that they view their job as a significant aspect of their life (Enrico, 2019) and acknowledge the importance of their performance for their self-worth (Gopinath, 2019). This perception of job involvement plays a crucial role in productivity, as such individuals are motivated by their performance. Baig (2002) defines productivity as a measure of economic performance that compares the output of goods and services produced with the inputs required to generate those goods and services. According to Smith, productive labor is any work that results in a tangible object, while Vittal (2002) posits that unproductive labor is any work where value is consumed immediately upon creation. Smith contrasted the contributions of laborers in a manufacturing setting (productive work) with those of a servant (unproductive work).

Sumanth (1990) views productivity as a family of ratios that compare output to input. The living standards of a country are closely tied to its productivity levels, which are measured by the quantity of goods and services produced per unit of national resources. Sink (1985) further elucidates productivity by relating it to time and the application of a universal system of calculation. According to Sink, productivity represents the relationship between outputs from a given system and the inputs into that system over a specific period. Lawlor (1985) offers two interpretations of productivity; the simplest definition describes it as the ratio of goods produced and sold or services provided (output) to the resources consumed in the process (output/input = productivity).

2.3 Safety Culture

Safety culture is the enduring value and priority placed on worker and public safety by everyone in every group at every level of an organization. It refers to the extent to which individuals and groups will commit to personal responsibility for safety act to preserve, enhance and communicate safety concerns, strive to actively learn, adapt and modify (both individual and organizational) behavior based on lessons learned from mistakes, and be rewarded in a manner consistent with these values (Hui Zhang, Wiegmann, von Thaden & Alyssa, 2002). According to Asamani (2020) Safety culture is a concept defined at group level or higher, which refers to the shared values among all the group or organization members. Safety culture is concerned with formal safety issues in an organization, and closely related to, but

not restricted to, the management and supervisory systems. Kornli (2013) stated that Safety culture emphasizes the contribution from everyone at every level of an organization.

The safety culture of an organization has an impact on its members' behavior at work. Safety culture is usually reflected in the contingency between reward system and safety performance. However, Safety culture is reflected in an organization's willingness to develop and learn from errors, incidents, and accidents. Safety culture is relatively enduring, stable and resistant to change (Zohar & Luria, 2004). Safety culture is the collection of the beliefs, perceptions and values that employees share in relation to risks within an organization, such as a workplace or community (Silbey, 2009). Safety culture is a part of organizational culture, and has been described in a variety of ways; notably the National Academies of Science and the Association of Land Grant and Public Universities have published summaries on this topic in 2014 and 2016 (Mirzaei, Arghami, Mohammadi & Kamali, 2018).

2.4 Safety Training

Safety training is a teaching tool designed to enhance employees' awareness of safety practices in all areas of the workplace (Barnett, 2000). It encompasses a range of activities aimed at equipping workers with the knowledge and skills necessary to perform their duties safely and effectively (Wang, Lin & Hou, 2015). The training focuses on informing individuals about the hazards and risks associated with various work activities and providing instruction on how to identify, report, and address workplace incidents (Hilyer, Veasey, Oldfield & Craft-McCormick, 2000). Workplace safety training is often mandated by government regulatory bodies, such as the Occupational Safety and Health Administration (OSHA) in the United States. As noted by Giant (2023), organizations with efficient safety training programs may experience reduced turnover, enhanced productivity, and improved morale. Furthermore, the evolving landscape of workplace safety, particularly in light of COVID-19, necessitates that safety training methods remain current (Taylor, 2015). Effective safety training refers to training materials that aim to teach occupational safety and health standards established by OSHA. This agency has developed numerous standards and regulations impacting employers and employees throughout the United States. Employers have a legal obligation to educate employees on workplace safety standards and potential hazards they may encounter while on the job. Providing effective safety training fulfills this responsibility (OSHA, 1998).

2.5 Management Compliance

Compliance management is a systematic process that organizations employ to ensure adherence to applicable laws, regulations, standards, and internal policies (Yule et al., 2007). This entails the planning, organization, control, monitoring, and leadership of systems and actions that align with relevant requirements. The implementation of compliance management can differ across industries and geographical locations, impacting data and IT infrastructure, as well as other organizational facets (Cooper & Phillips, 2004). Effective compliance management aids organizations in maintaining ethical practices and minimizing the risks associated with noncompliance. According to Zohar and Luria (2005), compliance management is an

ongoing process involving the monitoring and assessment of systems to confirm alignment with industry standards, security protocols, and regulatory policies (Arocena & Núñez, 2010; Udodiugwu, 2024). This includes evaluating infrastructure to identify systems that fail to meet compliance due to regulatory changes, policy updates, misconfigurations, or other factors.

The significance of compliance management is underscored by the potential consequences of noncompliance, which may comprise fines, security breaches, loss of certification, and other adverse effects on business operations (Baldock, James, Smallbone & Vickers, 2006). By remaining informed about compliance changes and updates, organizations can mitigate disruptions to business processes and optimize financial resources. Management commitment to safety is indicated by the extent of attention provided by top management to safety-related issues, as evidenced by the support and encouragement extended to employees (Hsu et al., 2007). This involvement includes proactive measures by top management aimed at identifying, managing, and controlling workplace hazards. When employees recognize that management prioritizes their safety, it can lead to increased seriousness regarding safety matters and, consequently, a reduction in accident and injury rates (Hofmann & Stetzer, 1996).

2.6 Employee Attitude

Employee attitude is essential for fostering organizational success. Akintayo (2010) articulates it as the degree of devotion an employee feels toward their organization. Avolio, Zhu, Koh, and Bhatia (2014) further define employee attitude as an effective response to the organization as a whole, emphasizing the loyalty and attachment employees develop. Allen and Meyer (2010) provide a broader understanding, describing employee attitude as a reflection of how employees engage with their organization. The implications of employee attitude are significant. Those with low engagement may only meet minimum performance standards, often prioritizing personal achievements over the organization's objectives. Such individuals may view themselves as outsiders, making them more susceptible to attractive job offers from elsewhere (Avolio, *et al.* 2014; Udodiugwu, Eneremadu, Onunkwo, Onyia & Gloria, 2024).

Conversely, employees with a positive attitude toward their organization identify as integral members of the team. They perceive threats to the organization as personal threats and actively engage with its mission and values. These committed employees are often motivated to innovate and enhance their job performance, treating the organization's success as their own. Recognizing the relationship between employee attitude and performance is vital for creating an environment that encourages both individual and organizational growth. By fostering positive employee attitudes, organizations can cultivate a dedicated and proactive workforce, ultimately leading to shared success.

2.7 Revenue Growth

Revenue refers to the money a business earns from all sources, including sales, investments, interest, royalties, and more, before any expenses are deducted. Whereas, Sales are the amount of money a business earns solely from selling goods and services – before any expenses are subtracted (Wolk, Dodd & Rozycki, 2008). If a business' only source of revenue is sales, then revenue and sales can be used synonymously. Revenue

growth is a key performance indicator expressed as a percentage, representing how able your company is to grow its revenue over a period. This time frame could refer to a monthly, quarterly, semi-annual, or yearly period, depending on how often you want to calculate said growth.

According to Joseph (2008) revenue growth refers to an increase in revenue over a period of time. In accounting, revenue growth is the rate of increase in total revenues divided by total revenues from the same period in the previous year. Revenue is money brought into a company by its business activities. There are different ways to calculate revenue, depending on the accounting method employed. It is necessary to check the cash flow statement to assess how efficiently a company collects money owed. Revenue growth can be measured as a percent increase from a starting point. Geraghty and Johnson, (1997) opine that Revenue growth is the percentage change in a company's total revenue from one period to the next. It's typically reported quarterly or annually. Companies may sometimes track revenue growth more frequently, such as monthly or daily (Eneremadu, Chikezie, & Udodiugwu, 2023).

2.8 Employee Performance

Employee performance refers to how your workers behave in the workplace and how well they perform the job duties you've obligated to them. Your company typically sets performance targets for individual employees and the company as a whole in hopes that your business offers good value to customers, minimizes waste and operates efficiently (Griffin, Parker & Mason, 2010). For an individual employee, performance may refer to work effectiveness, quality and efficiency at the task level. Your salesperson, for example, may be expected to complete a certain quota of calls to potential leads per hour with a specific portion of those resulting in closed sales. On the other hand, a production worker may have performance requirements for product quality and hourly output.

Individual performance affects your team and organizational performance. If you have employees who can't keep up or who perform subpar work, this means that other workers may have to pick up the slack or that you have to have work redone (Griffin, Parker & Mason, 2010; Udodiugwu & Enyinna, 2023). When employee performance is poor, you may not be able to satisfy your customers and thus see negative impacts on your profits, company reputation and sales. The specific metrics used to monitor employee performance will ultimately depend on the type of work your business does (Hair, Black, Babin & Anderson, 2010). However, there are some universal metrics to consider. Businesses should monitor the quality of work, individual employee goals, and effectiveness of training and employee efficiency. Evaluating quality of work and efficiency helps you prevent expensive mistakes, makes it more likely that your employees meet deadlines and reduces wasted time, materials and effort (Huang, Ryan, Zabel & Palmer, 2014; Obiakor, Anah, Udodiugwu, & Obiakor, 2024). Evaluating the effectiveness of training and individual employee work goals will help you determine if employees are best equipped to perform their jobs and to offer guidance when needed.

2.9 Theoretical Framework

This work focuses on the principles of Game Theory, which was developed by John von Neumann and Oskar Morgenstern in 1944 and has significantly evolved over time.

Game Theory serves as a robust framework for managers, enabling them to systematically analyze the interactions among different workforce members in a workplace. This analysis aids in the development of effective strategies aimed at enhancing safety and health outcomes (Hila, Yael & Sara, 2023). Its application in various construction settings underscores its potential, especially in the context of "Using Game Theory for Improving Safety within Chemical Industrial Parks." This work offers a comprehensive exploration of game-theoretic modeling that can significantly enhance cross-company prevention and safety management in such industrial environments (Zhang, 2021).

Given the harmful consequences of safety accidents, implementing effective safety management is paramount. Numerous factors are involved in the safety management process, and the interactions and behaviors among these factors profoundly influence safety performance (Zamiri-Noghreh, Safarzadeh & Ranjbar, 2023). To better understand the mechanisms of interaction in safety management, scholars have utilized Game Theory as a lens through which to examine these dynamics (Saad, Alpcan, Basar & Hjorungnes, 2010). Essentially, Game Theory can be characterized as a mathematical model that encapsulates strategic interactions between independent entities. By simulating and analyzing scenarios within this model, participants can identify effective solutions that guide informed decision-making strategies (Bouderba & Moussa, 2019).

The application of Game Theory in safety management offers several key characteristics and advantages:

i. Universality of Research Objects: The conflicts of interest and collaborative efforts exhibited by various roles are common occurrences in real-life situations.

ii. Comprehensive Research Methods: By employing mathematical models to articulate the problems being studied, Game Theory enhances the accuracy of analyses and facilitates the examination of complex behaviors that traditional mathematical tools may struggle to address.

iii. Enhanced Effectiveness of Results: Unlike conventional assumptions that rely on complete competition and perfect information, Game Theory focuses on rational decision-makers, leading to findings that resonate more closely with real-world scenarios.

Overall, incorporating Game Theory into safety management can pave the way for innovative strategies and improved outcomes in workplace safety.

2.10 Empirical Review

Onwudiwe et al. (2018) conducted a study on safety and health management in the aluminum sector of Owerri, Nigeria, using a 16-item questionnaire with 40 respondents. They found a significant relationship between safety policies, operating costs, and training, recommending prioritization of safety in organizational activities.

Otitolaiye et al. (2019) examined the impact of safety culture and management systems on safety performance in Lagos's food and beverage industries. Through surveys of 178 safety managers and SmartPLS analysis, they

confirmed a positive correlation between safety culture, management systems, and safety performance.

Emma-Ochu et al. (2021) explored challenges to health and safety compliance in construction projects in South East Nigeria, using both quantitative and qualitative data from surveys and observations. They identified issues such as bribery, lack of safety culture, and inadequate training as barriers, recommending enhanced enforcement to improve compliance.

Asamani (2020) investigated safety behavior in relation to safety culture and performance among rice farm workers. Involving 469 respondents, the study used Partial Least Square Structural Equation Modeling and found that safety culture strongly predicted safety behavior, which in turn had a partial mediating effect on safety performance. The findings highlighted the need for better understanding of safety practices in agricultural settings.

3.1 Methodology

The research design implemented in this study was a descriptive survey design method, which primarily aims to systematically describe the data and examine the characteristics of the phenomenon under investigation. The research was carried out within the Nnewi North Local Government Area of Anambra State, Nigeria, a region characterized by a diverse population and a rich industrial landscape. The study's target population consisted of 420 employees from Afro-Asia Automobile & Plastic Limited, a prominent manufacturing company located in Otolo Nnewi, Anambra State. To gather data, we utilized a five-point Likert scale questionnaire, which was designed to capture the nuances of employee perceptions and attitudes regarding various aspects of their work environment and organizational culture.

Data analysis was conducted using descriptive statistics to answer the research questions, providing a clear summary of the trends and patterns observed in the responses. In addition, the hypotheses formulated for the study were tested using a simple linear regression technique, allowing for a robust examination of the relationships between dependent and independent variables. This comprehensive methodological approach ensured that the findings of the study were both valid and reliable, contributing valuable insights to the understanding of employee dynamics in the automobile and plastics sector in Nigeria.The model specification for this study was given thus;

$Y = \beta o + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e\mu$

Where:

Y = Productivity Improvement
X = Safety Management
βo =Constant
β1 = 3 Beta Coefficient
X_1= Safety Culture
X_2= Safety Training
X_3= Safety Policies
Y_1= Employee Attitude
Y_2= Revenue Growth
Y_3= Employee Performance
e = error term

The nexus between Safety Management and Productivity Improvement of this present study were ascertained using the following model:

Productivity Improvement= *f* (Safety Management) + μ

X_1, Y_1 $SC = \beta_o + \beta_1 EA + \mu$ - - - - -Ho_1

X_2, Y_2 $ST = \beta_o + \beta_1 RG + \mu$ - - -- - - $-Ho_2$
X_3, Y_3 $SP = \beta o + \beta_1 EP + \mu$ - - - - - $-Ho_3$

4.1 Results

A total of four hundred and twenty (420) copies of the questionnaire were distributed to the selected respondents. Out of these, four hundred and twelve (412) copies were diligently completed and returned, reflecting a commendable response rate of 98%. In contrast, six (6) copies, accounting for 1.5%, were inadequately filled out by the respondents, and an additional two (2) copies, which constituted a mere 0.5% of the overall total, were reported missing. Consequently, the analysis for this study was exclusively based on the four hundred and twelve (412) completed questionnaires, which represent a substantial 98% of the sample population.

Analysis of Question One: What is the impact of safety culture on employees' attitude of plastic manufacturing firms in Nnewi North, Anambra State, Nigeria?

Table1 Descriptive Statistics

ITEM	SA	A	U	D	SD	Per %
i: A positive safety culture exists when employees understand the importance of safety	199 48.3%	94 22.8%	45 10.9%	22 5.3%	52 12.8%	412 100%
ii: Positive safety behaviours include wearing personal protective equipment (PPE)	184 44.7%	145 35.2%	24 5.8%	37 9.0%	22 5.3%	412 100%
iii: Good workplace safety attitudes are represented by attentiveness, eagerness, alertness, carefulness, task focused, team-oriented and seriousness.	197 47.8%	138 33.8%	21 5.1%	35 8.5%	21 5.1%	412 100%
iv: Bad workplace safety attitudes are represented by emotional acts, tiredness, risk-taking, recklessness, selfishness and carelessness.	184 44.7%	140 34.0%	24 5.8%	40 9.7%	24 5.8%	412 100%

Source: Field Survey, 2025

Table 1 presents an extensive analysis of a sample population totaling four hundred and twelve (412) individuals, representing 100% of the respondents. Among these, one hundred and ninety-nine (199) respondents, accounting for 48.3%, expressed a strong agreement with the given statements. Additionally, ninety-four (94) participants, making up 22.8%, conveyed agreement, while forty-five (45) individuals, representing 10.9%, remained undecided. A smaller group of twenty-two (22) respondents, corresponding to 5.3%, articulated disagreement, and fifty-two (52) participants, which is 12.8%, expressed strong disagreement.

Further analysis within Table 1 shows a breakdown whereby one hundred and eighty-nine (184) respondents, or 44.7%, indicated strong agreement, while one hundred and forty-five (145), constituting 35.2%, agreed. Moreover, twenty-four (24) individuals, equating to 5.8%, were undecided, thirty-seven (37), representing 9.0%, disagreed, and twenty-two (22), or 5.3%, strongly disagreed.

Continuing with the data, Table 1 reveals that one hundred and ninety-seven (197) participants, reflecting 47.8%, responded with strong agreement. In contrast, one hundred and thirty-eight (138), comprising 33.8%, agreed. A total of twenty-one (21) respondents, representing 5.1%, opted for undecided, while thirty-five (35) individuals, equating to 8.5%, expressed disagreement, along with another twenty-one (21), which also reflects 5.1%, who responded with strong disagreement.

Lastly, the table indicates that one hundred and eighty-four (184) respondents, amounting to 44.6%, reported strong agreement, while one hundred and forty (140), or 34%, agreed. Further, twenty-four (24) individuals, representing 5.8%, indicated an undecided stance. Furthermore, forty (40) respondents, making up 9.7%, disagreed, with another twenty-four (24), mirroring 5.8%, responding with strong disagreement.

Analysis of Question Two: To what extent does safety training impact on the revenue growth of plastic manufacturing firms in Nnewi North, Anambra State, Nigeria?

Table 2 Descriptive Statistics

ITEM	SA	A	U	D	SD	Per %
i: Safety training refers to the training program for employees to learn about precautionary processes, procedures and practice their applications to mitigate risk.	184 44.7%	140 34.0%	24 5.8%	40 9.7%	24 5.8%	412 100%
ii: Safety training provides employers, managers, supervisors, and workers with: Knowledge and skills needed to do their work safely and avoid creating hazards that could place themselves or others at risk	184 44.7%	140 34.0%	24\ 5.8%	40 9.7%	24 5.8%	412 100%
iii: Training your team enables rapid growth that's scalable in terms of productivity and overall size	184 44.7%	145 35.2	24 5.8%	37 9.0%	22 5.3%	412 100%
iv: Workplace safety is an issue businesses can manage and control—if they have the right tools to measure the economic impact of occupational injuries and illnesses	197 47.8%	138 33.5%	21 5.1%	35 8.5%	21 5.1%	412 100%

Source: Field Survey, 2025

Table 2 presents a detailed analysis of a sample population comprising four hundred and twelve individuals (412), constituting 100% of the surveyed group. Among these respondents, a notable one hundred and eighty-four participants, representing 44.7%,

expressed a strong agreement with the given statements, highlighting a significant level of enthusiasm or satisfaction. In contrast, one hundred and forty respondents, accounting for 34%, indicated their agreement, suggesting a generally positive but slightly less fervent response.

A minority of twenty-four individuals (24), which corresponds to 5.8%, remained undecided, signaling some ambivalence or uncertainty regarding the subject matter. Meanwhile, forty respondents, making up 9.7% of the population, indicated disagreement, reflecting a degree of dissent or discontent, while another twenty-four participants (24), or 5.8%, expressed strong disagreement, emphasizing a clear opposition to the statements presented.

Furthermore, Table 2 provides additional insights by presenting the data through a variant analysis of the same population. On this occasion, one hundred and eighty-four respondents once again strongly agreed (44.7%), but the figures varied slightly with one hundred and forty-five individuals (145), or 35.2%, indicating agreement. The undecided group remained steady at twenty-four (24) respondents; representing 5.8%, while those who disagreed decreased slightly to thirty-seven (37), accounting for 9.0%. Strong disagreement was reported by twenty-two (22) individuals, translating to 5.3%.

In another iteration of the data, the responses show that one hundred and ninety-seven participants (197), representing 47.8%, strongly agreed, while one hundred and thirty-eight individuals (138), or 33.5%, agreed. The undecided group altered slightly to twenty-one (21), representing 5.1%, with thirty-five respondents (35), or 8.5%, indicating disagreement. Lastly, a consistent twenty-one participants (21), corresponding to 5.1%, expressed strong disagreement, reinforcing the varied perspectives captured within this comprehensive data set.

Analysis of Question Three: To what degree does management compliance to safety policies impact on the employees' performance of plastic manufacturing firms in Nnewi North, Anambra State, Nigeria?

Table 3 Descriptive Statistics

ITEM	SA	A	U	D	SD	Per %
i: Compliance managers ensure that a business, its employees and its projects comply with all relevant regulations and specifications.	183 44.4%	135 32.8%	27 6.6%	43 10.4%	24 5.8%	412 100%
ii: Good compliance management means the organization practices appropriate authorization controls and logging procedures to ensure investigations into a data breach can be carried out.	183 44.4%	135 32.8%	27 6.6%	43 10.4%	24 5.8%	412 100%

iii: Compliance and safety management begins with your senior management team	196 47.6%	132 32.0%	23 5.6%	36 8.7	25 6.1%	412 100%
iv: Depending on the industry or the nature of work, there are likely to be strict safety regulations that may apply to the industry or the jurisdiction.	185 44.9%	137 44.9%	25 6.1%	41 10.0%	24 5.8	412 100%

Source: Field Survey, 2025

Table 3 indicated a total sample population of four hundred and twelve (412) at 100%, of which one hundred and eighty-three (183) representing 44.4% responded to strongly agree, one hundred and thirty-five (135) representing 32.8% responded to agree, twenty seven (27) representing 6.6% responded undecided, forty three (43) representing 10.4% responded disagree, while twenty-four (24) representing 5.8% responded strongly disagree. Table 3 also indicated a total sample population of four hundred and twelve (412) at 100%, of which one hundred and eighty-three (183) representing 44.4% responded to strongly agree, one hundred and thirty-five (135) representing 32.8% responded to agree, twenty seven (27) representing 6.6% responded undecided, forty three (43) representing 10.4% responded disagree, while twenty-four (24) representing 5.8% responded strongly disagree.

Table 3 further indicated a total sample population of four hundred and twelve (412) at 100%, of which one hundred and ninety-six (196) representing 47.6% responded to strongly agree, one hundred and thirty-two (132) representing 32.0% responded to agree, twenty three (23) representing 5.6% responded undecided, thirty six (36) representing 8.7% responded disagree, while twenty-five (24) representing 6.1% responded strongly disagree. Table 3 also indicated a total sample population of four hundred and twelve (412) at 100%, of which one hundred and eighty-five (185) representing 44.9% responded to strongly agree, one hundred and thirty-seven (137) representing 44.9% responded to agree, twenty five (25) representing 6.1% responded undecided, forty one (41) representing 10.0% responded disagree, while twenty-four (24) representing 5.8% responded strongly disagree.

4.2 Text of Hypotheses

Text of Hypotheses One

$H0_1$: There is no significant impact of safety culture on employees' attitude of plastic manufacturing firms in Nnewi North, Anambra State, Nigeria.

Table 4a Model Summary

Model	R	R Square[b]	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.823[a]	.825	.002	1.61958	.906

a. Predictors: (Constant), Safety Culture
b. Dependent Variable: Employee Attitude

Table 4b ANOVAa,b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6227.932	1	6227.932	2374.322	.003[c]
	Residual	1078.068	411	2.623		
	Total	7306.000[d]	412			

a. Dependent Variable: Employee Attitude

Table 4c Coefficients[a,b]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	Constant	.942	.019	.923	48.727	.003

a. Dependent Variable: Employees Attitude
b. Independent Variable: Safety Culture

The analysis reveals a compelling relationship between the dependent variable, Employee Attitude, and the independent variable, Safety Culture. The regression sum of squares stands at an impressive 6227.932, markedly greater than the residual sum of squares, which is 1078.068. This disparity underscores a pronounced positive influence that Safety Culture has on Employee Attitude, as articulated by our linear regression model.

The F statistic, a robust measure of the model's effectiveness, is calculated at 2374.322, complemented by a Durbin-Watson coefficient value of 0.006. These figures strongly indicate a significant impact of Safety Culture on the predictors selected for this study. The correlation coefficients, R and R^2, measured at 0.823 and 0.825 respectively, further affirm this relationship, suggesting that an impressive 82.3% to 82.5% of the variation in Employee Attitude can be attributed to the influence of Safety Culture within plastic manufacturing firms.

In diving deeper into the linear regression analysis, we observe a low error of estimate, indicated by the value of 1.61958, alongside a Durbin-Watson statistic of 0.906. Both values falling below 2 suggest minimal autocorrelation, thereby reinforcing the argument that Safety Culture is unlikely to be coincidentally unlinked to Employee Attitude.

The culmination of this analysis is highlighted by the results of the linear

regression test, showcasing a T-value of 48.727 and a P-value of 0.003. Given that the P-value of 0.003 is well below the conventional threshold of 0.05, we are compelled to reject the null hypothesis. Consequently, this study confidently concludes that there is indeed a significant positive effect of Safety Culture on Employee Attitude among plastic manufacturing firms located in Nnewi North, Anambra State, Nigeria.

Text of Hypotheses Two

$H0_2$: There is no significant impact of safety training on revenue growth of plastic manufacturing firms in Nnewi North, Anambra State, Nigeria.

Table 5a Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.999[a]	.998	.998	.04929	1.000

a. Predictors: (Constant), Safety Training
b. Dependent Variable: Revenue Growth

Table 5b ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	582.849	1	582.849	239942.929	.000[b]
	Residual	.996	410	.002		
	Total	583.845	411			

a. Dependent Variable: Revenue Growth
b. Predictors: (Constant), Safety Training

Table 5c Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	.004	.009	.876	48.840	.015

a. Dependent Variable: Revenue Growth

The regression sum of squares (583.845) is greater than the residual sum of squares (.996) which indicates a positive effect of the dependent variable (Revenue Growth) on the independent variable (Safety Training) as explained by the model. The F statistic value of 239942.929 on the Durbin-Watson coefficient value of 1.000 proved a high effect of the dependent variable on the predicator. The R and R^2 coefficient which has a value of 0.999 and 0.998 indicated that Safety Training has a significant positive effect on Revenue Growth in the plastic manufacturing firms at a value percentages of 99.9% and 99.8% of the variation in the effectiveness of the established model as explained above. Considering the linear regression analysis, the error of estimate is

low, with a value of .04929, and also the Durbin Watson statistics coefficient of 1.000 which are both less than 2 indicates that there is no auto effect to support the argument that by chance safety training may not have any effect on revenue growth. From the analysis demonstrated above, the study had concluded while providing the results of the linear regression test of a T-value of 48.840 and a P-value of 0.015. Since P-value (0.015) which is less than the pre-set value of 0.05, the study accepted the null hypothesis, and therefore concluded that safety training has a significant positive effect on revenue growth plastic manufacturing firms in Nnewi North, Anambra State, Nigeria.

Text of Hypotheses Three

$H0_3$: There is no significant impact of management compliance to safety policies on the employees' performance of plastic manufacturing firms in Nnewi North, Anambra State, Nigeria.

Table 6a Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.743[a]	.759	.057	1.15992	.282

a. Predictors: (Constant), Management Compliance
b. Dependent Variable: Safety Policies

Table 6b ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	34.737	1	34.737	25.819	.000[b]
	Residual	551.622	410	1.345		
	Total	586.359	411			

a. Dependent Variable: Safety Policies.
b. Predictors: (Constant), Management Compliance.

Table 6c Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.100	.198	.243	15.663	.002

a. Dependent Variable: Safety Policies

The regression sum of squares (586.359) is greater than the residual sum of squares (551.622) which indicates a positive effect of the dependent variable (Safety Policies) on the independent variable (Management Compliance) as explained by the model. The F statistic value of 25.819 on the Durbin-Watson coefficient value of 0.282 proved a high effect of the dependent variable on the predicator. The R and R^2 coefficient which

has a value of 0.743[a] and 0.759 indicated that Management Compliance has a significant positive effect on Safety policies in the plastic manufacturing firms at a value percentages of 74.3% and 75.9.8% of the variation in the effectiveness of the established model as explained above. Considering the linear regression analysis, the error of estimate is low, with a value of 1.15992, and also the Durbin Watson statistics coefficient of 0.282 which are both less than 2, hence it indicates that there is no auto effect to support the argument that by chance Management Compliance may not have any effect on Safety policies. From the analysis demonstrated above, the study had concluded while providing the results of the linear regression test of a T-value of 15.663and a P-value of 0.002. Since P-value (0.002) which is less than the pre-set value of 0.05, the study accepted the null hypothesis, and therefore concluded that management compliance has a significant positive effect on safety policies plastic manufacturing firms in Nnewi North, Anambra State, Nigeria.

5.1 Conclusion

This study rigorously explored the influential role of safety management practices on enhancing productivity within plastic manufacturing firms located in Nnewi North Local Government Area of Anambra State, Nigeria. The findings revealed a significant positive correlation between a robust safety culture and the attitudes of employees in these firms, indicating that a strong emphasis on safety can foster a more engaged and conscientious workforce. Furthermore, the research highlighted the vital role of safety training in driving revenue growth. It was established that employees who received regular and comprehensive safety training were not only more adept at performing their tasks efficiently but also contributed positively to the organization's overall financial performance.

Additionally, the study identified a noteworthy relationship between management's adherence to safety policies and employees' performance. When management demonstrated a commitment to safety compliance, there was a corresponding increase in employee productivity and morale, showcasing that a safe work environment directly reflects on workers' output. In conclusion, the study asserts that effective safety management practices play a crucial role in the productivity enhancement of plastic manufacturing firms in the Nnewi North LGA.

Based on these findings, it is recommended that the management of plastic manufacturing firms prioritize the establishment and maintenance of a strong safety culture. Such a culture can significantly guide employees in their daily operations and decision-making processes, ensuring they consistently engage in safe practices. Additionally, it is essential for management to implement regular training programs that equip employees with the necessary skills to properly handle tools and perform their tasks safely, thereby minimizing the risk of workplace hazards. Furthermore, management must diligently comply with all applicable safety regulations

and policies to safeguard their employees' welfare, particularly in the unfortunate event of an accident. By prioritizing safety management, firms can not only protect their workforce but also promote a more productive industrial environment.

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