COMPARATIVE ANALYSIS OF SAFETY PROGRAMMES AND EMPLOYEE PRODUCTIVITY IN THE OIL AND GAS AND CONSTRUCTION INDUSTRIES IN THE NIGER DELTA REGION

Abstract

This study assesses the impact of safety programmes on employee productivity in selected Oil and Gas and Construction industries in the Niger Delta. A descriptive cross-sectional design was used, surveying 390 employees through structured questionnaire distributed online. Data analyses were conducted using IBM SPSS (version 26) and Xlstat (version 16), with reliability of constructs confirmed by Cronbach's alpha values between 0.630 and 0.916. Bartlett's and Kaiser-Meyer-Olkin (KMO) tests established the suitability of Principal Component Analysis (PCA), and a Multiple Correspondence Analysis (MCA) explored the relationship between reward mechanisms for safety compliance across industries. The findings show that **Management Commitment (MC)** is highest in Oil and Gas (Multinational) companies (mean = 4.56), correlating with higher productivity (mean = 4.16), while Construction (Indigenous) companies score the lowest (mean = 3.49), with reduced productivity (mean = 4.05). **Safety Participation (SP)** and **Safety Compliance (SC)** are consistently strong across industries, particularly in Oil and Gas (Multinational), which also leads in **Safety Promotional Policies (SPP)** and **Safety Training (ST),** both linked to higher productivity. **Safety Knowledge (SK)** and **Employee Involvement (EI)** also show positive associations with productivity, especially in Multinational firms. In all, the study highlights that robust safety management practices, especially in Multinational Oil and Gas companies, significantly enhance employee productivity. Strengthening safety parameters like management commitment, compliance, and training is essential for improving productivity across industries.

Key words: Comparative Analysis, Employee Productivity, Safety Constructs, Construction, Principal Component Analysis, Oil & Gas Companies, Niger Delta

1. INTRODUCTION

The assessment of safety programmes in industries is a critical area of study, especially in regions like the Niger Delta, where oil, gas, and construction sectors dominate the economy. These industries are often associated with high-risk environments, making safety an integral factor not only for employee well-being but also for enhancing productivity. Safety programmes are designed to mitigate risks, reduce accidents, and create a safe working environment, which, in turn, contributes to employee productivity (Burke et al., 2006).

In the context of the Niger Delta, where industries are diverse and complex, it is essential to evaluate the effectiveness of safety programmes through a comprehensive analysis of key safety parameters. This study focuses on seven critical safety parameters: Management Commitment (MC), Safety Compliance (SC), Safety Participation (SP), Safety Promotional Policies (SPP), Safety Training (ST), Safety Knowledge (SK), and Employee Involvement (EI). These parameters serve as the foundation for understanding the relationship between safety programmes and employee productivity.

1. Management Commitment (MC)

Management commitment is crucial to fostering a safety culture within an organization. Studies have shown that when management actively demonstrates a commitment to safety, employees are more likely to adhere to safety policies and practices, leading to fewer accidents and higher productivity (Hofmann & Morgeson, 1999). In the high-risk industries of the Niger Delta, such commitment is essential for establishing trust and ensuring that safety standards are upheld consistently.

2. Safety Compliance (SC)

Safety compliance refers to the extent to which employees follow established safety regulations and procedures. Compliance is a direct indicator of the effectiveness of safety programmes. Clarke (2006) found that strict adherence to safety rules reduces workplace incidents, which translates to fewer work interruptions and enhanced productivity. In industries where safety risks are prevalent, such as oil and gas, compliance is non-negotiable for maintaining operational efficiency.

3. Safety Participation (SP)

Employee participation in safety-related activities is another critical factor that influences productivity. Griffin and Neal (2000) demonstrated that when employees actively engage in safety

programmes, such as through reporting hazards or suggesting improvements, there is a direct impact on reducing safety risks and improving overall organizational performance. In the Niger Delta, where industries rely heavily on manual labor, fostering employee participation in safety decisions can significantly enhance productivity.

4. Safety Promotional Policies (SPP)

Safety promotional policies are strategies implemented by organizations to encourage safe behavior among employees. These policies often include rewards for adhering to safety standards or public recognition of safe practices. Vredenburgh (2002) highlighted that safety promotional policies create a positive safety climate, which leads to fewer workplace injuries and improved productivity. In regions like the Niger Delta, where hazardous work environments are common, effective promotion of safety awareness is vital for reducing accident rates and ensuring continuous operations.

5. Safety Training (ST)

Safety training equips employees with the knowledge and skills necessary to perform their tasks safely. While training is essential for minimizing workplace accidents, it can also impact productivity if not implemented effectively. Burke et al. (2006) noted that well-structured safety training programmes lead to better safety outcomes and improved employee performance. However, excessive or poorly timed training sessions can detract from productive time. In the Niger Delta, where industries operate under tight deadlines, striking a balance between training and productivity is key.

6. Safety Knowledge (SK)

Safety knowledge refers to the understanding that employees have regarding safety protocols and risks in their work environment. Griffin and Neal (2006) found that employees with higher safety knowledge are more efficient in their work, as they can identify and avoid potential hazards. In

high-risk sectors such as oil and gas, well-informed employees contribute not only to a safer workplace but also to improved productivity, as they can perform their tasks with greater confidence and efficiency.

7. Employee Involvement (EI)

Employee involvement in safety-related decisions fosters a sense of ownership and responsibility for maintaining a safe work environment. Hale et al. (2010) emphasized that involving employees in safety planning and decision-making processes results in higher levels of compliance and productivity. In the context of the Niger Delta, where industrial activities pose significant safety risks, encouraging employee involvement can enhance both safety outcomes and operational efficiency.

2. MATERIALS AND METHODS

The major instrument used was a structured questionnaire to obtain responses on assessment of safety programmes on employee's productivity in selected Oil and Gas and Construction industries in Niger Delta Area. Sample size 390 was determined using Equation (2.1), **(Cochran, 1957)**:

$$N = \frac{Z^2 p(1-\alpha)}{T^2} \qquad (2.1)$$

Where N = Sample size; Z = the abscissa of the normal curve that cuts off an area α at the tails, (1 – p) = the desired confidence level (i.e. 95%); T= Tolerance error (or the desired level of precision); and p = Estimated Proportion of an attribute that is present in the population without considering the finite population correction factor (fpc).

A total of 390 copies of the structured questionnaire was developed and administered for data collection among Indigenous and Multinational Oil and Gas companies as well as Indigenous and Multinational Construction companies across Niger Delta Area using Google Forms, an online survey tool. The "required option" for each question was activated making it impossible for respondent to proceed to the next question and subsequently submit the survey without providing answer to each question. This has helped to eliminate the receipt of unusable survey response.

Most of the questions were structured using Likert scale (5-Strongly agrees, 4- agreed, 3-Disagree, 2-Strongly Disagree, 1-Undecided) in order to prevent ambiguity and the need for guessing in the analysis of the data. The respondents were assured of the confidentiality of their responses. Out of the 390 questionnaires distributed, 350 were successfully retrieved, representing a retrieval rate of 89.74%. The high retrieval rate is likely due to the ease of digital submission, which allowed respondents to complete and submit their questionnaires online without the need for physical retrieval. However, about 40 questionnaires were not returned, accounting for 10.25% of the total distributed questionnaires. Consequently, 350 questionnaires were considered fit for use in the statistical analysis, resulting in a response rate of 94.59%.

The study area used in this research work is selected Industries in Niger Delta Area. It is focused on the comparative analyses of safety programmes on employee's productivity in selected Oil and Gas and construction Industries in Niger Delta Area. Four categories of companies were assessed. Multinational and Indigenous Oil and Gas companies as well as Multinational and Indigenous construction companies, respectively.

2.1 INSTRUMENTS

The administration of questionnaire with 350 participants was by random sampling, while the selection of the oil and gas as well as construction companies was by purposive sampling.

Information captured in the questionnaire included Gender, Age, Level of education, Marital status and Years of experience. The administered questionnaire also includes information on the following: Management Commitment, Safety Participation, Safety Compliance, Safety Promotional Policies, Safety Training, Safety Knowledge, Employee Involvement/Participation and Employee Productivity. There are 7 broad questions on Management Commitment, 6 questions on Safety Participation, 5 questions on Safety Compliance, 6 questions on Safety Promotional Policies, 5 questions on Safety Training, 6 questions on Safety Knowledge, 4 questions on Employee Involvement/Participation and 5 questions on Employee Productivity using Likert Scale.

2.2 DATA ANALYSIS AND PROCEDURES

The statistical analyses in this research were conducted using two powerful statistical software packages: SPSS version 26 (Statistical Product and Service Solution) and XLSTAT version 16. In SPSS, the Analyze menu was extensively utilized, particularly the Descriptive Statistics tool for computing means, standard deviations, minimum and maximum values which helped characterize the demographic data and safety program constructs. The Scale Reliability Analysis tool in SPSS was employed to calculate Cronbach's alpha coefficients, assessing the internal consistency of the research constructs. For examining relationships between variables, SPSS's Bivariate Correlation tool was used to generate Pearson correlation coefficients, providing insights into the associations between safety program elements and employee productivity.

XLSTAT, as an Excel add-in, complemented SPSS by offering advanced statistical capabilities. The Principal Component Analysis (PCA) module in XLSTAT was utilized, incorporating its built-in Bartlett's sphericity test and Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. The software's rotation options, particularly the Varimax rotation, were employed to enhance the interpretability of the factor structure. XLSTAT's visualization capabilities were leveraged to

create biplots, effectively displaying the relationships between variables and observations in the PCA space. For categorical data analysis, XLSTAT's Correspondence Analysis module was employed to perform Multiple Correspondence Analysis (MCA), generating symmetry plots and conducting chi-square tests of independence.

3. RESULTS AND DISCUSION

3.1 Respondents Distribution in Constrution & Oil & Gas Industries

The distribution of respondents across different company types is presented in Table 1. The data shows that a significant portion of the respondents worked in multinational oil and gas companies, with 158 respondents (45.1%) from this industry. This was followed by indigenous oil and gas companies, which accounted for 97 respondents (27.7%). The construction industry also had notable representation, with 64 respondents (18.3%) working in multinational construction companies and 31 respondents (8.9%) from indigenous construction companies. This distribution emphasizes that a large percentage of the respondents were employed in the oil and gas industry, with multinational companies being the dominant employers. The results reflect the focus of the study on safety programmes and productivity in the oil and gas and construction industries, highlighting the participation of both indigenous and multinational companies in the analysis.

Table 1: Respondents in the various companies

Company Type	Number	Percentage (%)	Cumulative Percentage (%)
Construction (Indigenous)	31	8.9	8.9
Construction (Multinational)	64	18.3	27.2
Oil and Gas (Indigenous)	97	27.7	54.9
Oil and Gas (Multinational)	158	45.1	100
Total	350	100	

3.2 Reliability of Constructs

The reliability of the safety programme constructs, and productivity measure was assessed using Cronbach's alpha, with the as results presented next. The analysis revealed good internal consistency across all measures, with Cronbach's alpha values ranging from 0.630 to 0.916. Management Commitment demonstrated the highest reliability with a Cronbach's alpha of 0.916 (standardized 0.920), followed closely by Safety Training at 0.895 (standardized 0.898). Safety Knowledge and Safety Compliance both showed strong reliability with Cronbach's alpha values of 0.867 (standardized 0.877) and 0.862 (standardized 0.861) respectively. Employee Involvement/Participation and Safety Promotional Policies exhibited good reliability, both with Cronbach's alpha values of 0.849 (standardized 0.850). Safety Participation, while having the lowest Cronbach's alpha of 0.630, still indicated good reliability when considering its standardized value of 0.741. The Employee Productivity measure also demonstrated good reliability with a Cronbach's alpha of 0.785 (standardized 0.787).

These results are particularly noteworthy as they all meet or exceed the generally accepted threshold of 0.70 for Cronbach's alpha, with most constructs showing excellent internal consistency ($\alpha > 0.80$). Even Safety Participation, which had the lowest unstandardized alpha, still demonstrates good reliability when its standardized value is considered. This consistency across all constructs suggests that the measurement scales used for assessing safety programme constructs and employee productivity in this study are robust and reliable.

The high reliability scores across these constructs indicate that the questionnaire items within each construct are closely related and effectively measure the same underlying concept. This strong internal consistency enhances the validity of the study's findings, as it suggests that the data

collected through these measures are likely to provide a consistent and accurate representation of the safety programmes and productivity in the selected industries in Niger Delta Area.

3.2 Relationship between safety programme construct and productivity

The Pearson correlation analysis presented in Table 2 provides insights into the relationships between various safety programme constructs and employee productivity. All correlations in the table are statistically significant at the 0.05 level, indicating meaningful relationships between the variables.

Management Commitment (MC) shows moderate to strong positive correlations with most other constructs. It has the strongest relationship with Safety Training (ST) (r = 0.69) and Employee Involvement (EI) (r = 0.67), suggesting that higher management commitment is associated with better safety training and increased employee involvement. MC also has a strong correlation with Safety Promotional Policies (SPP) (r = 0.64), indicating that management commitment is closely tied to the implementation of safety promotion efforts. This is in tandem with Ajmal et al. (2022), Idoro, (2011) and Abudayyeh et al. (2006)

Safety Participation (SP) demonstrates moderate positive correlations with most constructs, with the strongest relationship being with Safety Compliance (SC) (r = 0.56). This suggests that employees who actively participate in safety initiatives are more likely to comply with safety regulations. This support the findings of Zhao and Yan (2023) that enhancing safety compliance is crucial in high-risk industries.

SP also shows a moderate correlation with Safety Knowledge (SK) (r = 0.52), indicating that participation in safety activities is associated with increased safety knowledge.

Safety Compliance (SC) shows strong correlations with Safety Knowledge (SK) (r = 0.61) and Safety Training (ST) (r = 0.54), suggesting that employees with better safety knowledge and training are more likely to comply with safety regulations. SC also has moderate correlations with most other constructs, indicating its central role in safety programmes. Both of these constructs are important for creating a safety culture within an organization (Dhal et al., 2018).

Safety Promotional Policies (SPP) demonstrates strong correlations with Safety Training (ST) (r = 0.66) and Employee Involvement (EI) (r = 0.66), suggesting that effective safety promotion is closely tied to training efforts and employee engagement in safety matters.

Safety Training (ST) shows moderate to strong correlations with all other constructs, highlighting its crucial role in safety programmes. Its strongest relationships are with Management Commitment (MC) (r = 0.69) and Safety Promotional Policies (SPP) (r = 0.66), emphasizing the importance of management support and promotional efforts in effective safety training.

Safety Knowledge (SK) demonstrates moderate to strong correlations with most constructs, with the strongest relationship being with Safety Compliance (SC) (r = 0.61). This underscores the importance of safety knowledge in ensuring compliance with safety regulations.

Employee Involvement (EI) shows strong correlations with Management Commitment (MC) (r = 0.67), Safety Promotional Policies (SPP) (r = 0.66), and Safety Training (ST) (r = 0.63), highlighting the interconnected nature of these aspects in fostering employee engagement in safety matters.

Employee Productivity (EP) shows positive correlations with all safety programme constructs, albeit generally weaker than the inter-correlations among the safety constructs themselves. The strongest correlation for EP is with Safety Knowledge (SK) (r = 0.49), followed by Safety

Participation (SP) (r = 0.40). This suggests that while safety programmes are positively associated with productivity, the relationship is not as strong as the relationships among the safety constructs themselves. This could indicate that, unlike direct involvement in safety, mere participation without other factors may not significantly impact productivity (Griffin & Neal, 2000).

Table 2: Relationship between the Safety Programme and Productivity

Variables	MC	SP	SC	SPP	ST	SK	EI	EP
MC	**1.00**							
SP	**0.28**	**1.00**						
SC	**0.43**	**0.56**	**1.00**					
SPP	**0.64**	**0.35**	**0.42**	**1.00**				
ST	**0.69**	**0.42**	**0.54**	**0.66**	**1.00**			
SK	**0.38**	**0.52**	**0.61**	**0.41**	**0.53**	**1.00**		
EI	**0.67**	**0.44**	**0.41**	**0.66**	**0.63**	**0.30**	**1.00**	
EP	**0.23**	**0.40**	**0.37**	**0.29**	**0.32**	**0.49**	**0.28**	**1.00**

Values in bold are different from 0 with a significance level alpha=0.05

The descriptive statistics presented in Table 3. provide a detailed breakdown of safety programme constructs and employee productivity across four industry types: Construction (Indigenous), Construction (Multinational), Oil and Gas (Indigenous), and Oil and Gas (Multinational).

Starting with Management Commitment (MC), we observe varying levels across industries. Oil and Gas (Multinational) shows the highest mean score of 4.56 (SD = 0.49), indicating strong management commitment to safety. This is followed by Oil and Gas (Indigenous) with a mean of 4.09 (SD = 0.85), and Construction (Multinational) at 3.99 (SD = 0.75) positively correlating with high productivity (Karam & Tasmin, 2020). Construction (Indigenous) shows the lowest mean score for MC at 3.49 (SD = 0.68), aligning with lower productivity levels (Gabriel et al., 2021). Construction industry, multinational companies often display higher levels of management

commitment to safety compared to indigenous firms, which may struggle with limited financial resources in the Niger Delta (Idoro, 2011).

For Safety Participation (SP), all industries demonstrate high levels, with means ranging from 4.37 to 4.53. Oil and Gas (Indigenous) leads with a mean of 4.53 (SD = 0.40), closely followed by Construction (Multinational) at 4.43 (SD = 0.54). Oil and Gas (Multinational) and Construction (Indigenous) show similar levels at 4.38 (SD = 0.43) and 4.37 (SD = 0.57) respectively, indicating consistently high employee participation in safety activities across all industries. This support the findings of John-Eke & Gabriel (2021) that employee-driven efforts can mitigate some leadership gaps.

Safety Compliance (SC) shows strong results across all industries, with means above 4.40. Oil and Gas (Multinational) leads with a mean of 4.70 (SD = 0.45), followed closely by Construction (Multinational) at 4.69 (SD = 0.50) and Oil and Gas (Indigenous) at 4.66 (SD = 0.33). Construction (Indigenous), while still high, shows the lowest mean at 4.41 (SD = 0.66), suggesting generally strong adherence to safety rules across all industries. This high compliance supports productivity by reducing workplace incidents (Huang et al., 2004).

Safety Promotional Policies (SPP) reveal more variation. Oil and Gas (Multinational) leads with a mean of 4.30 (SD = 0.63), followed by Oil and Gas (Indigenous) at 4.12 (SD = 0.74). Construction (Multinational) shows a mean of 3.85 (SD = 0.77) enhancing productivity (Naji et al., 2022), while Construction (Indigenous) has the lowest mean at 3.15 (SD = 0.92), indicating potential areas for improvement in safety promotion within this industry. This can contribute to lower productivity as noted by Emma-Ochu et al., (2021).

Safety Training (ST) scores are highest in Oil and Gas (Multinational) with a mean of 4.66 (SD = 0.39), followed closely by Construction (Multinational) at 4.39 (SD = 0.67) and Oil and Gas (Indigenous) at 4.34 (SD = 0.70). This high scores supports productivity by reducing workplace incidents (Huang et al., 2004). Construction (Indigenous) shows the lowest mean at 3.48 (SD = 1.05), suggesting a need for enhanced safety training in this industry which also highlights deficiencies that hinder productivity according to Kaynak et al., (2016).

Safety Knowledge (SK) demonstrates high levels across all industries, with means above 4.40. Both Oil and Gas (Multinational) and Construction (Multinational) lead with means of 4.69 (SD = 0.39 and 0.40 respectively). Oil and Gas (Indigenous) follows at 4.51 (SD = 0.48), with Construction (Indigenous) at 4.41 (SD = 0.48), indicating strong safety knowledge across all industries that leads to higher productivity as supported by Hanaysha (2016).

Employee Involvement (EI) shows the most variation among constructs. Oil and Gas (Multinational) leads with a mean of 4.07 (SD = 0.60), followed closely by Oil and Gas (Indigenous) at 3.97 (SD = 0.89). Construction (Multinational) shows a lower mean of 3.20 (SD = 1.03), while Construction (Indigenous) has the lowest at 2.92 (SD = 0.89), suggesting room for improvement in employee involvement, particularly in the construction industry. This affects productivity negatively as opined by Huang et al., (2004).

Employee Productivity (EP) shows relatively consistent results across industries. Construction (Multinational) leads with a mean of 4.23 (SD = 0.46), followed closely by Oil and Gas (Multinational) at 4.16 (SD = 0.56). Oil and Gas (Indigenous) and Construction (Indigenous) show similar levels at 4.07 (SD = 0.61) and 4.05 (SD = 0.40) respectively, indicating generally high perceived productivity across all industries. This is supported by Bhatti & Qureshi (2007) and

Aksorn and Hadikusumo (2008), who found that effective safety programmes improve safety performance and productivity.

These results suggest that while all industries demonstrate strengths in various safety programme aspects, there are notable differences between industries, with Oil and Gas (Multinational) generally showing the highest scores across most constructs, and Construction (Indigenous) often showing the lowest. This analysis provides valuable insights for targeted improvements in safety programmes across different industry types.

Table 3. Descriptive Statistic Results for Safety Programme and Productivity base on Industry

What industry you work in?	Construct	N	Minimum	Maximum	Mean	Std. Deviation
Construction (Indigenous)	MC	31	2.43	5.00	3.49	0.68
	SP	31	3.50	5.00	4.37	0.57
	SC	31	3.00	5.00	4.41	0.66
	SPP	31	1.83	4.50	3.15	0.92
	ST	31	1.40	4.80	3.48	1.05
	SK	31	3.67	5.00	4.41	0.48
	EI	31	1.50	4.25	2.92	0.89
	EP	31	3.40	4.60	4.05	0.40
Construction (Multinational)	MC	64	2.00	5.00	3.99	0.75
	SP	64	2.83	5.00	4.43	0.54
	SC	64	3.20	5.00	4.69	0.50
	SPP	64	2.17	5.00	3.85	0.77
	ST	64	2.20	5.00	4.39	0.67
	SK	64	4.00	5.00	4.69	0.40
	EI	64	1.00	5.00	3.20	1.03
	EP	64	3.40	5.00	4.23	0.46
Oil and Gas (Indigenous)	MC	97	1.86	5.00	4.09	0.85
	SP	97	3.67	5.00	4.53	0.40
	SC	97	4.00	5.00	4.66	0.33
	SPP	97	2.00	5.00	4.12	0.74

	ST	97	2.20	5.00	4.34	0.70
	SK	97	3.17	5.00	4.51	0.48
	EI	97	1.75	5.00	3.97	0.89
	EP	97	2.20	5.00	4.07	0.61
Oil and Gas (Multinational)	MC	158	2.14	5.00	4.56	0.49
	SP	158	3.33	5.00	4.38	0.43
	SC	158	3.20	5.00	4.70	0.45
	SPP	158	2.17	5.00	4.30	0.63
	ST	158	3.40	5.00	4.66	0.39
	SK	158	3.50	5.00	4.66	0.39
	EI	158	2.50	5.00	4.07	0.60
	EP	158	2.40	5.00	4.16	0.56

3.3 Principal Component Analysis

The principal component analysis (PCA) was applied to assess the relationship between safety programme construct and demographic parameters. The analysis is presented in Table 4 and Figures 1 & 2, focusing on understanding the underlying patterns within the dataset.

The Bartlett's sphericity test and the Kaiser-Meyer-Olkin (KMO) test were first conducted to determine whether PCA was appropriate. The Bartlett's test yielded a chi-square value of 1376.62, which was significantly higher than the critical value of 41.38, leading to the rejection of the null hypothesis (p-value < 0.0001). This indicates that there is a correlation among the variables, and the correlation matrix is not an identity matrix. Also, the KMO test produced a value of 0.859, signifying a strong pattern in the data, thus confirming that PCA is suitable for this analysis.

The biplot provides a visual representation of the relationship between the safety programme constructs and is presented in Figure 1. Oil and Gas (Multinational) industry is located on the right side of the biplot, close to Safety Training (ST), Management commitment (MC), Safety Promotional Policies (SPP), and Employee Involvement (EI). This suggests that these safety

constructs are more positively associated with multinational oil and gas companies as supported by (Ehiaguina et al., 2024; Karam and Tasmin, 2020).

Oil and Gas (Indigenous) industry is positioned more centrally in the biplot, implying a more moderate or balanced relationship between the safety constructs. The result from the biplot clearly shows that construction (Indigenous) was on the left side of the biplot farthest away from Safety Training (ST), Management commitment, Safety Promotional Policies (SPP), and Employee Involvement (EI). This indicated that construction indigenous had the lowest level of these four safety programme constructs than the other industries.

Table 4: Bartlett Sphericity test and Kaiser-Meyer-Olkin test

Statistical Test	Statistic	Value
Bartlett's sphericity test	Chi-square (Observed value)	1376.62
	Chi-square (Critical value)	41.38
	DF	28
	p-value	< 0.0001
	alpha	0.05
Kaiser-Meyer-Olkin	KMO	0.859

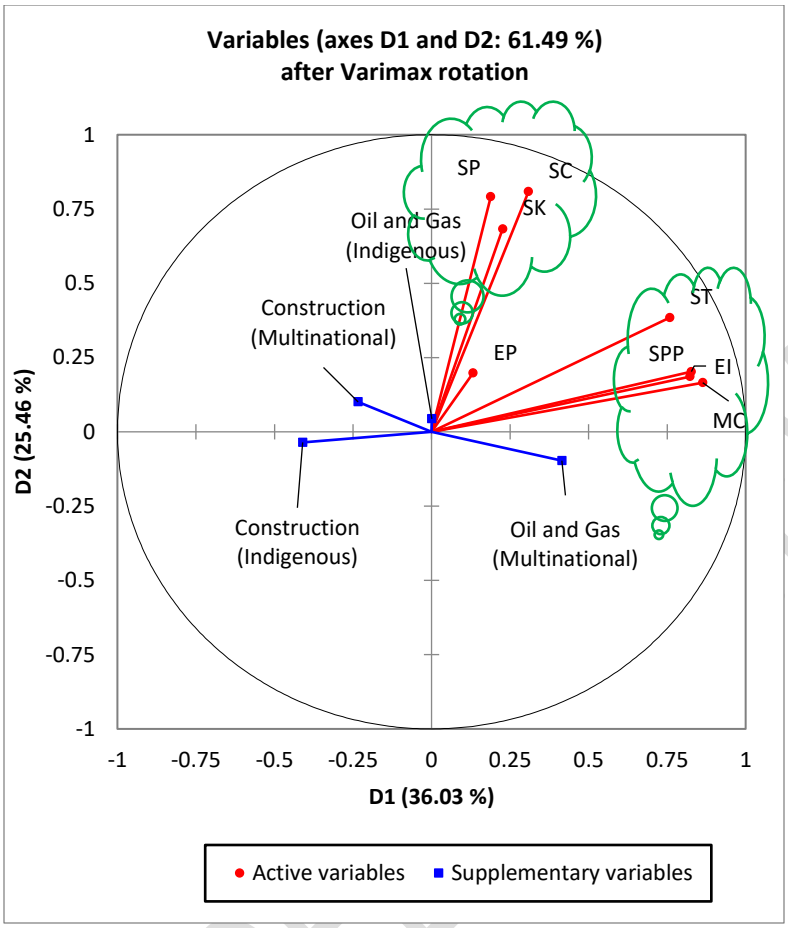

Figure 1: Interaction between safety programme factors and industry type (principal components 1 and 2)

Figure 2 shows the result of the biplot for principal components 1 and 3. The result from the biplot shows that construction (multinational) had the highest level of employee productivity due to it been the closest to that construct on the biplot.

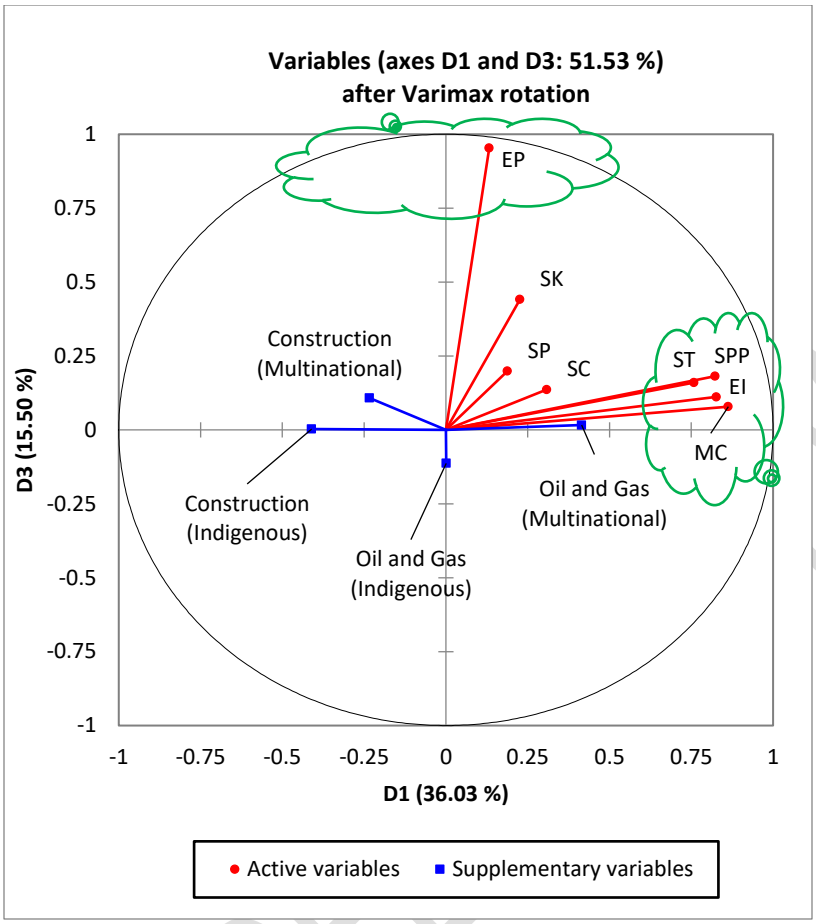

Figure 2: Interaction between safety programme factors and industry type (principal components 1 and 3)

4. CONCLUSION

The study concludes that safety programmes play a vital role in enhancing employee productivity in both the oil and gas as well as construction industries, with notable differences between indigenous and multinational companies. Multinational firms demonstrated stronger adherence to safety compliance, better safety knowledge, and more comprehensive safety training programmes, all of which contributed to higher levels of employee productivity. Conversely, indigenous firms exhibited weaker correlations between safety constructs and productivity, particularly in areas

such as management commitment and employee involvement. The study highlights the importance of investing in robust safety measures and fostering a safety-conscious culture to improve organizational outcomes. Tailored safety programmes that address the unique challenges of each industry are essential for boosting productivity, ensuring compliance, and enhancing overall workplace safety.

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