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Modeling of Safety Training, Behaviour and Performance in Selected Oil and Gas Companies: A Case Study of the Niger Delta

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The aim of this study is to model the safety training, safety behavior and safety performance in selected oil and gas companies in Niger delta. Safety training was segregated into teaching and practical safety trainings. Safety behavior was captured using safety compliance and safety participation while safety performance is taken as accident occurrence. The study adopted inferential research design. Multi-stage sampling technique was used to sample five companies

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from the study area while Taro Yamane sample size formula was used to estimate 400 samples from the study population. Structured questionnaire, designed based on 5-point Likert scale, was used for data collection; Pearson correlation, regression and t-test were used for the analyses. The Pearson coefficient of the correlation analysis results revealed that the relationship between Teaching-based Safety Training and Practical-based Safety Training was the strongest (PC = 0.818), followed by the relationship with safety compliance (PC = 0.305) and lagging safety performance (PC = 0.174) while safety participation has the weakest correlation with teaching-based safety training (PC= 0.003). It was concluded that safety training has significant impact on safety behavior and safety performance. The t-test established that there is no significant difference between teaching-based and practical-based safety trainings in the sampled oil and gas firms in Niger-Delta. Teaching-based safety training has positive but insignificant impact on reduction of accident occurrence while practical-based safety training has positive and significant impact on reduction of accident occurrence. It is recommended that management of oil and gas firms should utilize complete safety training package in order to enhance both safety behavior and safety performance of their workers.

Keywords: Safety training; safety behavior; safety performance; oil and gas companies.

1. INTRODUCTION

It is a common knowledge that safety training is an essential component of formally organized safety programs. Providing employees with safety training will help them gain information, increase abilities, and improve a more positive attitude. Moreover, it can make employees competent in executing their tasks in respect to safety and health concerns (HSE 1997). It is crucial to receive proper safety training considering today's quickly evolving high technology and workplace demands. Hence, it is necessary to provide all employees with the appropriate kind of safety training to enhance their safety behavior and better prepare them to deal with the hazards, risks, and dangers that they confront daily at their place of employment and by so doing improve their safety performance (Goetsch 2005, Sala et al. 2024).

In most contexts, when people hear the word "safety training," what they envision is a very specific kind of training that takes place within companies. According to Johnston et al. (1994), the definition of safety training is a process, either formal or informal, teaching or practical that assists individuals in acquiring information, altering attitudes, or executing safe work behaviors. It is said that safety knowledge refers to information about safety, safety behavior refers to sentiments linked with safety, and behavior relates to the safety performance of an organization, its management, or its employees respectively. According to Cooper (1998), safety training has been employed in the past as an effort to influence people's safety behaviors and attitudes in the workplace; safety training should not be used as a replacement for appropriate risk control because while it does have a place as a lower-order tool for limiting risk, it should not be used alone.

Safety behavior comprises of attitudes and behaviors that are consistent and in line with stimulated safety rules and procedures in any organization (Mukherjee et al. 2000). Effective safety training generally improves safety behavior in a firm. According to Mukherjee et al. (2000), managers and employees who took part in training improved their own behaviors and habits related to health and safety on the job. First aid training was shown to have a favorable impact on participants' occupational safety and health behavior, according to observations made by Lingard (2002) in their workplaces. It was also shown that safety training has a lot of potential to enhance workers' safety behaviors including wearing PPE as required and reduce the number of injuries in the workplace. In addition, as explained by Cooper & Phillips (2004), workers' estimations of the training's significance have a major role in forecasting the degree of safety behavior that will really occur. Generally, safety behavior is conceptualized using safety participation and safety compliance. While safety participation is concerned with the willingness to enforce safety rules and procedures in a firm, safety compliance entails complying to safety standards.

Many incidents that occur in the oil and gas companies may have been as a result of poor or inadequate training, while others may have been due to non-adherence of workers to work

procedures as well as non-implementation of safety measures that were gained from various training (Kaminski 2001, Kinn et al. 2000, Zierold & Anderson 2006).

Kaminski (2001), (Kinn et al. 2000, Zierold & Anderson 2006, Dong, et al. 2004, Johnson 2007) are of the view that studies have also demonstrated that the presence of safety training methods is inversely connected to the number of accidents and injuries that occur on construction sites. Thus, to improve the safety behavior of workers and overall safety performance in oil and gas firms, require effective safety training methods. Pingsday et al. (2008) identified safety training procedures at construction sites as being essential to enhancing safety performance. For proper safety compliance and practices, safety training is necessary particularly for the purpose of educating workers. Oil & Gas companies have the ultimate responsibility to ensure the well-being of their employees, prepare them for any potential hazards, and instruct them on how to avoid any harm. This can be accomplished through the provision of detailed and substantial teaching and practical based safety training on specific safety performance indicators, which were evaluated in selected oil and gas companies. Some examples of these indicators include lost time injuries (LTI), lost time accidents (LTA), and near misses.

Given the alarming knowledge gap in safety in industries in Niger Delta which is supported by Atkinson & Duff (2005) low safety awareness is related to more than 70% of the injuries that occurred on the job site. According to Baldwin & Ford (1994), (Cornell & Koll 2004) 10–15% of safety training results in practical advantages. Oil firms spend a significant amount of money on the planning, development, and delivery of health and safety training programs to enhance the on-site safety performance of their employees. The primary objective of the training program is to improve workers' overall safety performance by providing them with the knowledge and abilities necessary to identify and mitigate risks in an environment that is notoriously difficult to navigate safely (Hinze & Ganbadee 2003). Due to the number of fatal and non-fatal accidents that take place in oil and gas businesses located in the Niger Delta, these companies are continually looking for new and innovative ways to cut down on the number of accidents that take place on the job. A well-organized and goal-oriented approach to safety training is one of the most frequently referenced essential strategies in the relevant literature (Tam and Furg 1998). Even with the safety training programs in these selected companies, there are still injuries, disabilities and fatalities due to hazardous working processes within these oil and gas companies.

2. METHODOLOGY

2.1 Research Design

The study adopted inferential study design to evaluate the impact of both teaching and practical-style safety trainings on safety behavior and safety performance based on Pearson correlation, multiple regression analyses and test of significance.

2.2 Study Area

The Niger Delta Region is located in the southern part of Nigeria and falls under a tropical rain climate which occurs between 4^0N-10^0N of the equator and at an altitude between 1000 meters. It is home to about 30 million people. This area is the operational location of most oil and gas companies in Nigeria. This Study covers Rivers, Bayelsa and Delta States out of the Nine States that make up Niger Delta Region. Fig. 1 is the map of the Niger Delta showing geographical locations of some oil companies in the region which were investigated in this study.

2.3 Sample and Sampling technique

The estimated workers population in the sampled companies was put at 2,337 according to human resource department data of the oil and gas companies sampled for this study. The study adopted quantitative data collection method that uses questionnaire to gather data needed for the study. It employed questionnaire administration for this assessment which covers questions on safety training (teaching-style and practical-style safety training), safety behavior (safety participation and safety compliance) and safety performance (accident occurrence). The questionnaire was titled "Safety Training, Safety Behavior and Safety Performance of Oil and gas Firms" and comprised of items rated on a 5-point Likert scale of Strongly Agree (SA), Agree (A), Disagree (D) Strongly Disagreed (SD) and undecided (UN) with weighted values of 5, 4, 3, 2 and 1, respectively. The questionnaire was explained to the respondents by the research assistants before completion of the questionnaires. The data collected in the study were analyzed using Pearson correlation and

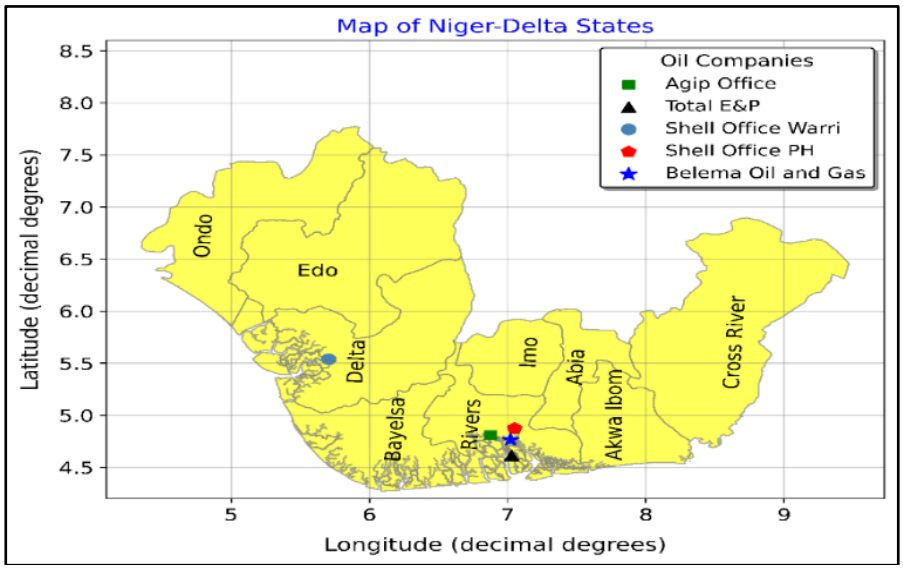

Fig. 1. Map of study area comprising Niger Delta region of Nigeria

multi-linear regression model. XL-STAT version 20.1 was used for the analysis.

Taro Yamane sample size determination formula was used see Equation (1):

$$n = \frac{N}{(1+N)(\varepsilon)^2)} \quad (1)$$

Where n = Sample size, N = Population under study (2337) and ε = Margin error (which is conventionally be 0.05 at 5% level of significance respectively).

$$n = \frac{2337}{(1+2337)(0.05)^2}$$

Hence, the sample size for this study is 400

3. RESULTS AND DISCUSSION

3.1 Pearson Correlation Analyses for Safety Training, Safety Behavior and Safety Performance

Table 1 shows the results of the Pearson correlation between the constructs of the study which comprised of Teaching-based Safety Training (TST), Practical-based Safety Training (PST), Safety Participation (SP), Safety Compliance (SC) and Accident Occurrence (AO).

The results revealed that there is positive and significant relationship between Teaching-based safety training, and other construct such as practical-based safety training, safety compliance, and safety performance and positive but insignificant relationship with safety participation. The Pearson coefficient of the correlation analysis results revealed that the relationship between Teaching-based Safety Training and Practical-based Safety Training was the strongest (PC = 0.818), followed by the relationship with safety compliance (PC = 0.305) and lagging safety performance (PC = 0.174) while safety participation has the weakest correlation with teaching-based safety training (PC= 0.003). These results suggest that increase in teaching-based safety training could have positive and significant effect on practical-based safety training, lagging safety performance and safety compliance but not on safety participation.

The results revealed that there is positive and significant relationship between practical-based safety training, and other construct such as teaching-based safety training, safety compliance, and safety performance, and positive but insignificant relationship with safety participation. The Pearson coefficient of the correlation analysis results revealed that the relationship between Practical-based Safety Training and teaching-based Safety Training was the strongest (PC = 0.818), followed by the relationship with safety compliance (PC = 0.235) and safety performance (PC = 0.234) while safety participation has the weakest correlation with practical-based safety training (PC= 0.036). These results suggest that increase in practical-based safety training could have positive and significant effect on teaching-based safety training, safety performance and safety compliance but not on safety participation.

Table 1. Pearson correlations for the study constructs

		TST	PST	SP	SC	AO
TST	Pearson Correlation	1	0.818	0.003	0.305	0.174
	Sig. (2-tailed)		0.000	0.953	0.000	0.001
	N	386	386	386	386	386
PST	Pearson Correlation	0.818	1	0.036	0.235	0.234
	Sig. (2-tailed)	0.000		0.484	0.000	0.000
	N	386	386	386	385	385
SP	Pearson Correlation	0.003	0.036	1	0.184	0.254
	Sig. (2-tailed)	0.953	0.484		0.000	0.000
	N	386	386	386	386	386
SC	Pearson Correlation	0.305	0.235	0.184	1	0.382
	Sig. (2-tailed)	0.000	0.000	0.000		0.000
	N	386	386	385	386	386
AO	Pearson Correlation	0.174	0.234	0.254	0.382	1
	Sig. (2-tailed)	0.001	0.000	0.000	0.000	
	N	385	386	386	0385	385

***. Correlation is significant at the 0.01 level (2-tailed); Note, TST = Teaching-based Safety Training, PST = Practical-based Safety Training, SP = Safety Participation, SC= Safety Compliance, AO = Accident Occurrence.*

The results also showed that there is positive and significant correlation between safety participation and other study constructs such as safety compliance and safety performance, and positive but insignificant relationship with teaching-based safety training and practical-based safety training. The Pearson correlation coefficient revealed that safety participation has the strongest relationship with safety performance (PC = 0.254) followed by the relationship with safety compliance (PC = 0.184) while teaching-based safety training has the weakest relationship with safety participation (PC = 0.003). These results implied that increase in safety participation could trigger substantial increase in safety performance and safety compliance.

The results revealed that there is positive and significant correlation between safety compliance and the other study construct which include Teaching-based Safety Training, Practical-based Safety Training, Safety Participation and Safety performance. However, the Pearson coefficient of the correlation showed that the relationship between safety compliance and safety performance is strongest (PC = 0.382) followed by teaching-based safety training (PC= 0.305), practical-based safety training (PC= 0.235) while safety participation had the least correlation with safety performance (PC = 0.184). These results suggest that increase in safety compliance could results to positive and substantial increase in the other constructs of the study. These findings align with the findings of other researchers such as (Cooper 1998) who stated that safety training contributes to achievement of better safe behavior such that improvement in safety training results in substantial improvement in safety behaviors.

The foregoing results implied that safety performance of the companies depends on all the constructs considered in this study which include: Teaching-based Safety Training, Practical-based Safety Training, Safety Participation and Safety Compliance suggesting that change in these constructs would trigger substantial change in safety performance of the sampled companies in the oil and gas sector. In line with the outcome of this current study, (Burke et al. 2011, Lee & Dalal 2016) explored how safety training was important in predicting workers' safety performance in the organizations and they revealed that safety training is an important predictor of safety performance such that improvement in safety training creates significant improvement in safety performance.

3.2 Multi-linear Regression Model for the Impact of Safety Training on Safety Behavior and Safety Performance

The multiple linear regression analysis was carried out to develop models that could mathematically explain and express the impact of teaching-based safety training and practical-based safety training, on safety behaviour and safety performance of the oil and gas firms operating in Niger-Delta. Thus, in the first regression analysis, safety performance (accident occurrence) is the dependent variable while safety training (teaching-based safety training, practical-based training) are independent variables. In the second regression analysis, safety behavior (safety participation) is the dependent variable while safety training (teaching-based safety training, practical-based training) are independent variables and in the last regression model safety behavior (safety compliance) is the dependent variable while safety training (teaching-based safety training, practical-based training) are independent variables.

3.2.1 Regression model for the impact of safety training and on safety performance

Table 2 shows the results of regression analysis carried out to ascertain the impact of safety training and safety performance (Accident occurrence). Safety training was segregated into teaching-based safety training and practical-based safety training. The results revealed that teaching-based safety training has positive but insignificant impact on reduction of accident occurrence at p-value of 0.534 greater than 0.05 significance level, such that 1 unit change in teaching-based safety training would result to 5.7% unit corresponding change in reduction of accident occurrence in the companies. The results also revealed that practical-based safety training has positive and significant impact on reduction of accident occurrence at p-value of 0.001 less than 0.05 significance level, such that 1 unit change in practical-based safety training would trigger corresponding 38% change in reduction of accident occurrence.

Table 2. Multi-linear regression analysis for impact of safety training and safety performance.

Parameter		B	Std. Error	Beta (R^2)	t	p-value.
AO	(Constant)	4.998	0.268		18.664	0.000
	TST	0.057	0.091	0.156	0.623	0.534
	PST	0.380	0.118		3.215	0.001

TST = Teaching-based Safety Training, PST = Practical-based Safety Training, AO = Accident Occurrence

In all, the Goodness of fit, R-square value of 0.156 implied that the two independent variables considered in this study which comprised of teaching-based safety training and practical-based safety training only contributed to 15.6% change in reduction of accident occurrence in the companies while 84.40% were contributed by other factors and constructs not considered in this analysis. Thus, the model that expresses the relationship between safety performance (accident occurrence) and independent variables that comprise of Safety training segregated into teaching-based safety training and practical-based safety training is as expressed in Equation (2). The coefficients of Equation (2) are as given in Table 2.

$$\mathrm{AO} = (0.057\mathrm{TST} + 0.380\mathrm{PST}) + 4.998 \qquad (2)$$

The findings of this study aligned with the work of (Sinclair et al. 2003) who in their empirical study showed that there is substantial reduction in twenty to twenty six out of thirty injuries arising from workplace accident in construction firms due to improvement in safety training. In line with outcome of this study, many studies have also demonstrated that the presence of safety training methods is inversely connected to the number of accidents and injuries that occur on construction sites (Kaminski 2001, Kinn 2000, Zierold et al. 2006, Dong et al. 2004, Johnson 2007). Cohen & Colligan (1998) in their study also reported that safety training is an important risk prevention and control strategy to guarantee safety of every employee from accidents and injuries in workplace.

3.2.2 Regression model for the impact of safety training and participation

Table 3 showed the results of regression analysis carried out to ascertain the impact of safety training and safety behaviour operationalized with safety participation. Safety training was segregated into teaching-based safety training and practical-based safety training. The results revealed that teaching-based safety training has positive but insignificant impact on safety participation at p-value of 0.371 greater than 0.05 significance level, such that 1 unit change in teaching-based safety training would result to 7.2% corresponding change in safety participation of the workers. The results also revealed that practical-based safety training has positive and significant impact on safety participation at p-value of 0.027 less than 0.05 significance level, such that 1 unit change in practical-based safety training would trigger corresponding 12.1% unit change in safety participation.

In effect, the Goodness of fit (R-square) value of 0.13 implied that the two independent variables considered in this study which comprised of teaching-based safety training and practical-based safety training only contributed to 13% change in safety participation while 87% were contributed by other factors and constructs not considered in this analysis. Thus, the model that expresses the relationship between safety participation and independent variables that comprise of Safety training segregated into teaching-based safety training and practical-based safety training is as shown in Equation (3). The coefficients of the model are extracted from Table 3.

$$\mathrm{SP} = 0.074\mathrm{TST} + 0.121\mathrm{PST} + 3.438 \qquad (3)$$

The finding of this study agreed with the position of Mukherjee et al. (2000) who stated that managers and employees who took part in training improved their own behaviors and habits related to health and safety on the job. The findings also aligned with observation made by Lingard (2002) that First-aid safety training have a favorable impact on participants' occupational safety and health behavior in their workplaces. Lingard (2002) also revealed that safety training has a lot of potential to enhance workers' safety behaviors including wearing PPE as required and reduce the number of injuries in the workplace. In addition, as explained by Cooper & Phillips (2004), workers' estimations of the safety training's significance have a major role in forecasting the degree of safety behavior that will really occur both in compliance and participation.

Table 3. Multi-linear regression analysis for impact of safety training on safety participation

Parameter					t	p-value
		B	Std. Error	R-square		
SP	Construct (Variable)	3.438	0.242		14.202	0.000
	TST	0.074	0.082	0.13	0.895	0.371
	PST	0.121	0.107		1.135	0.027

Note; TST = Teaching-based Safety Training, PST = Practical-based Safety Training, SP = Safety Participation

3.2.3 Regression model for the impact of safety training and safety compliance

Table 4 shows the results of regression analysis carried out to ascertain the impact of safety training and safety behaviour operationalized with safety compliance. Safety training was segregated into teaching-based safety training and practical-based safety training. The results revealed that teaching-based safety training has positive and significant impact on safety compliance at p-value of 0.000 less than 0.05 significance level, such that 1 unit change in teaching-based safety training would result to 26.3% corresponding change in safety compliance of the workers. The results also revealed that practical-based safety training has positive but insignificant impact on safety compliance at p-value of 0.596 greater than 0.05 significance level, such that 1 unit change in practical-based safety training would trigger corresponding 4.5% change in safety compliance.

Thus, the Goodness of fit, R-square value of 0.098 implied that the two independent variables considered in this study which comprised of teaching-based safety training and practical-based safety training only contributed to 9.8% change in safety compliance while 90.20% were contributed by other factors and constructs not considered in this analysis. Thus, the model that expresses the relationship between safety compliance and independent variables that comprise of Safety training segregated into teaching-based safety training and practical-based safety training is expressed in Equation (4) extracted from Table 4.

$$\mathrm{SC} = 0.263\mathrm{TST} + 0.045\mathrm{PST} + 4.356 \quad (4)$$

The outcome of this study aligned with findings of meta-analytic study by Christian et al. (2009) which showed that perceptions of safety training are positively related to safety compliance and participation of workers. Also, similar Meta-analysis study by Robson et al (2012) reported strong empirical evidence of the effectiveness of safety training on employees' safety behaviors both in safety compliance and participation of workers. The finding of the study also aligned with the position of Okoro et al. (2024) who explained that workers' estimations of the safety training's significance have a major role in forecasting the degree of safety behavior that will really occur both in compliance and participation.

3.3 Comparative Assessment of the Differences between Teaching-based Safety Training and Practical-Based Safety Training

Tables 5a & b show the results of the paired sample t-test carried out to determine the difference between the level of teaching-based safety training and practical-based safety training, and to also determine whether there is a statistically significant difference between teaching-based safety training and practical-based safety training among the oil and gas companies sampled in this study. The analysis is based on the response of the sampled respondents on the eight questions presented in the study to capture the level of the teaching-based safety training and practical-based safety training among the sampled oil and gas companies.

Table 4. Multi-linear regression analysis for safety compliance

Construct (Variable)					t	p-value.
		B	Std. Error	R-square		
SC	(Constant)	4.356	0.192		22.659	0.000
	TST	0.263	0.065	0.098	4.032	0.000
	PST	0.045	0.085		0.530	0.596

Note; TST = Teaching-based Safety Training, PST = Practical-based Safety Training, SC = Safety Compliance

Table 5a. Paired samples statistics

Construct (Variable)		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	TST	3.4733	8	0.41749	0.13916
	PST	3.2756	8	0.52750	0.17583

Table 5b. Paired samples t-test

Construct (Variable)		Paired Differences					
		Mean	Std. Deviation	Std. Error Mean	t	df	p-value
Pair 1	TST – PST	0.19778	0.74560	0.24853	0.796	8	0.449

Table 5a shows that mean of the teaching-based safety training (3.4733) greater than the mean value for practical-based safety training (3.2756). This means that there is more of teaching-based safety training in the sampled companies than the practical-based safety training. However, the results of the sampled t-test in Table 5b showed that the p-value of the comparative assessment of the mean is 0.449 which is greater than 0.05 significance level which means that there is no statistically significant difference between the two-mean compared suggesting that there is statistically insignificance between the level of teaching-based safety training and practical-based safety training. These results imply that the oil and gas companies sampled within the study area have the same level of commitment to both teaching-based safety training and practical-based safety training; and the disparity observed between the mean of the two-safety training is negligible and marginal therefore could be attributed to mere chance. These results agree with those of Okoro et al. (2024) and Ehiaguina et al. (2024).

4. CONCLUSION

The results of the study as presented give credence, to the following conclusion: that practical-based safety training has a positive and substantial impact on safety participation and accident occurrence but not on safety compliance. While teaching-based safety training has positive and significant impact on only safety compliance but not on safety participation and accident occurrence. This suggest that there is substantial evidence to prove that increasing the practical-based safety training would trigger a corresponding substantial increase in safety participation of the workers as well as reduced accident occurrence. There is no substantial indication that increase in practical-based safety training would trigger corresponding substantial increase in safety compliance of the workers. The outcome also suggested that there is substantial evidence to prove that increasing the teaching-based safety training would trigger a corresponding substantial increase in safety compliance of the workers. There is no substantial indication that increase in teaching-based safety training would trigger corresponding substantial increase in safety participation and reduction of accident occurrence. It was also concluded that there is no significant difference between teaching-based and practical-based safety training in the sampled oil and gas firms in Niger-Delta.

5. RECOMMENDATIONS

Based on the findings of this study, it is recommended that:

1. The management of the oil and gas companies should design means and techniques to motivate and encourage their workers to take both the teaching and practical aspects of safety training seriously as this would enhance their safety compliance and safety participation and by extension help to reduce the cases of incident and accident occurrence.
2. The workers of the oil and gas companies, having understood the dynamics and interplay between safety training, safety behavior and safety performance, should be serious and committed to both teaching and practical safety training sections to enhance their safety behavior and ultimately avoid being victims of incidents and accidents in their workplace.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image

generators have been used during the writing or editing of this manuscript.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

Atkinson, P., & Duff, M. (2005). The role of national culture and organisational climate in safety training. *European Journal of Work and Organizational Psychology*.

Baldwin, T. T., & Ford, J. K. (1994). Transfer of training: A review and direction for future research. *Personnel Psychology, 41*.

Burke, M. J., Chan-Serafin, S., Salvador, R., Smith, A., & Sarpy, S. A. (2011). The role of national culture and organizational climate in safety training effectiveness. *European Journal of Work and Organizational Psychology, 17*(1), 133-152.

Christian, E., Colligan, M. J., & Cohen, A. (2009). The role of training in promoting workplace safety and health. In J. Barling & M. R. Frone (Eds.), *The psychology of workplace safety* (pp. 121-137). Washington DC: APA Books.

Cohen, A., & Colligan, M. (1998). *Assessing occupational safety and health training: A review*. Ohio: National Institute for Occupational Safety and Health Publication.

Cooper, D. (1998). *Safety behaviours and health management planning*. Van Nostrand Reinhold.

Cooper, M. D., & Phillips, R. A. (2004). Exploratory analysis of the safety climate and safety behavior relationship. *Journal of Safety Research, 35*, 497-512.

Cornell, A., & Koll, A. (2004). Creating a culture where employees own safety. In *Proceedings of the 2000 Professional Development Conference*, London.

Dong, X., Entzel, P., Men, Y., Chowdhury, R., & Schneider, S. (2004). Effects of safety and health training on work-related injury among construction labourers. *Journal of Occupational Environment Medicine, 46*(12), 1222-1228.

Ehiaguina, E., et al. (2024). Safety culture assessment in the petroleum industry: Cross-sectional survey of workers' safety performance in the Niger Delta region, Nigeria. *Springer Nature - International Journal of Occupational Safety and Health Management*. Available at link.springer.com.

Goetsch, D. L. (2005). *Occupational safety and health for technologists, engineers, and managers*. New Jersey: Prentice Hall.

Health and Safety Executive (HSE). (1997). *Process guidelines: Health and safety climate surveys tool*. Sudbury: HSE Books.

Hinze, J., & Ganbadee, S. (2003). Norwegian workforce involvement in safety offshore: Regulatory framework and participants' perspective. *Employee Relations, 24*(5), 486-499.

Johnson, S. E. (2007). The predictive validity of safety climate. *Journal of Safety Research, 38*, 511-521.

Johnston, J. J., Catteledge, G. T. T., & Collins, J. W. (1994). The efficacy of training for occupational injury control. *Occupational Medicine: State of the Arts Reviews, 9*(2), 147-158.

Kaminski, M. (2001). Unintended consequences: Organisational practices and their impact on workplace safety and productivity. *Journal of Occupational Health Psychology, 6*(2), 127-138.

Kinn, S., Khunder, S. A., Bisesi, M. S., & Woolley, S. (2000). Evaluation of safety orientation and training programs for reducing injuries in the plumbing and pipefitting industry. *Journal of Occupational Environment Medicine, 42*, 1142-1147.

Lee, J., & Dalal, R. S. (2016). A multilevel assessment tool for the construction industry. *Journal of Safety Research* (pp. 12-14).

Lingard, H. (2002). The effect of first aid training on Australian construction workers' occupational health and safety motivation and risk control behaviour. *Journal of Safety Research, 33*, 209-230.

Mukherjee, S., Overman, L., Leviton, L., & Hilyer, B. (2000). Evaluating worker safety and health training. *American Journal of Industrial Medicine, 38*, 155-163.

Okoro, N. U., Ugwo, C. E., & Onodugo, I. J. (2024). Assessment of work-life balance and employee job satisfaction in oil and gas firms in the Niger Delta region of Nigeria. *International Journal of Multidisciplinary Research and Development*. Available at allmultidisciplinaryjournal.com.

Pingsday, et al. (2008). *Research method and methodology in occupational health and safety*. London: Thomson.

Robson, L., et al. (2012). Capacity building in occupational health and employee performance. *Canadian Social Science, 9*(3), 42-45.

Sala, L. T., Nwaogazie, I. L., & Ugbebor, J. N. (2024). A comparative analysis of safety programs and employee productivity in oil and gas versus construction industries in the Niger Delta region. *Asian Journal of Advanced Research and Reports*. Available at journalajarr.com.

Sala, L. T., Nwaogazie, I. L., & Ugbebor, J. N. (2024). Assessment of safety programmes on employee productivity in the oil and gas industry in the Niger Delta area, Nigeria. *Current Journal of Applied Science and Technology*. Available at journalcjast.com.

Sinclair, R. C., Smith, R., Colligan, M., Prince, M., Nguyen, T., & Stayner, L. (2003). Evaluation of safety training programs in three food service companies. *Journal of Safety Research, 34*, 547-558.

Tam, C. M., & Furg, C. (1998). A survey-based system for safety measurement and improvement. *Journal of Safety Research, 34* (2003), 157-163.

Zierold, K. M., & Anderson, H. (2006). The relationship between work permits, injury, and safety training among working teenagers. *American Journal of Industrial Medicine, 49*, 36-43.

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