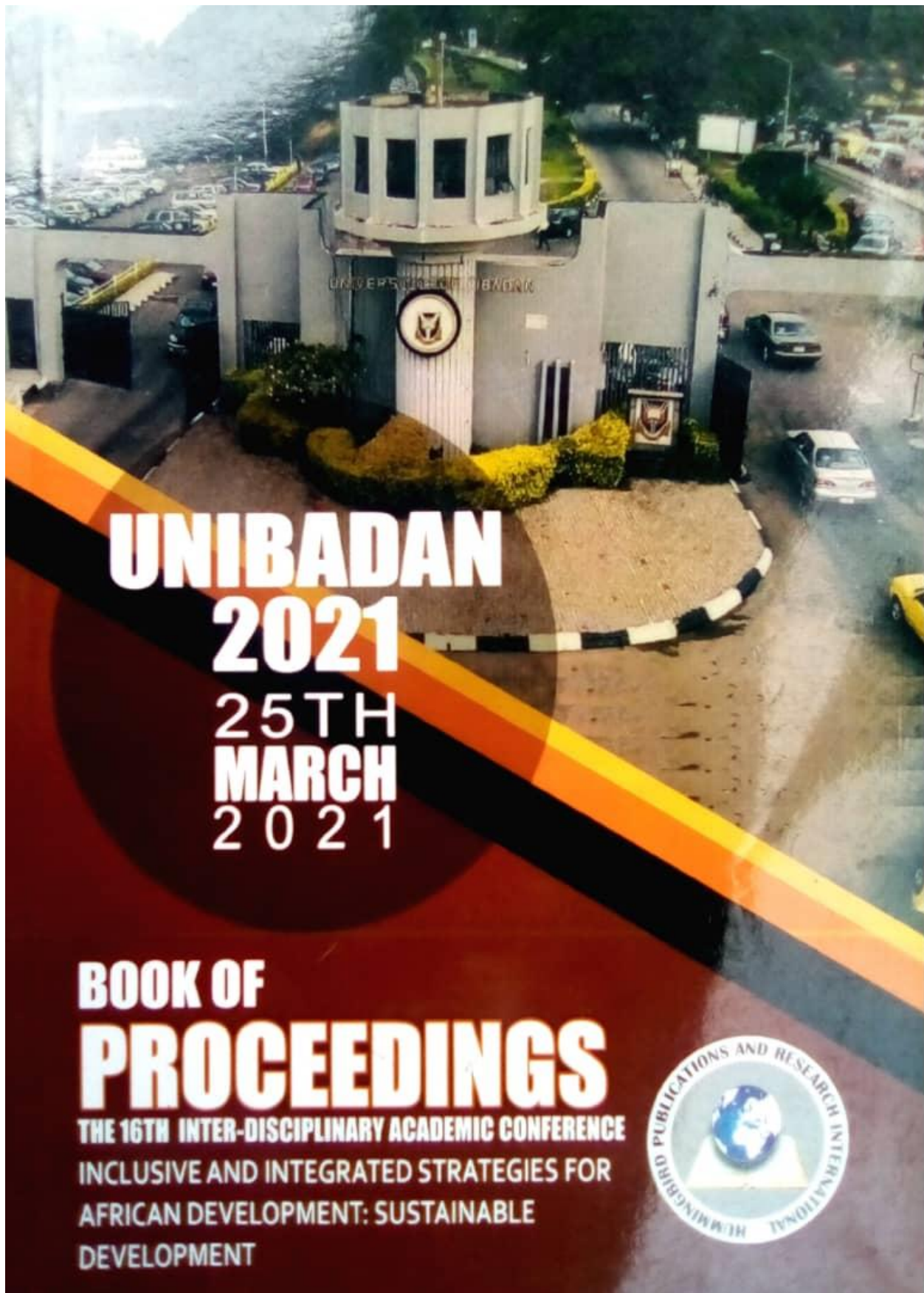


**CONFERENCE PROCEEDINGS**  
**14(c)**





**UNIBADAN**  
**2021**  
**25TH**  
**MARCH**  
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**BOOK OF**  
**PROCEEDINGS**  
THE 16TH INTER-DISCIPLINARY ACADEMIC CONFERENCE  
INCLUSIVE AND INTEGRATED STRATEGIES FOR  
AFRICAN DEVELOPMENT: SUSTAINABLE  
DEVELOPMENT



# PROCEEDINGS

*Integrated Strategies for African Development: Sustainable Development. Vol. 22 No. 2*

FOR THE

16<sup>TH</sup> INTERDISCIPLINARY ACADEMIC  
CONFERENCE

THEME:  
INCLUSIVE AND INTEGRATED STRATEGIES FOR  
AFRICAN DEVELOPMENT: SUSTAINABLE  
DEVELOPMENT

SUB THEME:

- *Science , Engineering & Environmental Technology*
- *Management Science & Entrepreneurship*
- *Humanities and Social Sciences*

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**OF**

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RESEARCH INTERNATIONAL**

**ON**

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DEVELOPMENT.**

**25<sup>th</sup> MARCH, 2021**

**AT**

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**THEME**

**INCLUSIVE AND INTEGRATED STRATEGIES FOR  
AFRICAN DEVELOPMENT: SUSTAINABLE  
DEVELOPMENT**

**DATE:**

**25<sup>TH</sup> MARCH, 2021.**

**VENUE: UNIVERSITY OF IBADAN, UNIBADAN, OYO  
STATE, NIGERIA**

## PROGRAMME OF ACTIVITIES

Days	Time	Activities
Day 1: Wednesday, March 24, 2021		Arrival/Pre-conference Meeting
Day 2: Thursday, March 25, 2021	8.00-10.00am	Registration
	10.00-1.00pm	Opening Ceremony
	1.00-2.00pm	Launch/Break
	2.00-3.00pm	Preliminary Section
	3.00-5.00pm	Paper presentation
	5.00-6.00pm	Certificates Presentation
Day 3: Friday, March 26, 2021		Departure

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## EVALUATION OF THE EFFECTIVENESS OF HEALTH AND SAFETY TRAINING PRACTICES IN MEDIUM SIZED CONSTRUCTION FIRMS IN ABUJA

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### **Abstract:**

*Health and Safety (H&S) training is one of the most widely adopted practices to improve workplace safety. Existing H&S literature focuses on training of workers in large sized construction firms leaving out the medium sized construction firms. This study therefore evaluated the effectiveness of H&S training practices of medium sized construction firms in Abuja, with a view to proposing strategies for reducing accidents on construction sites. The population for the study constitutes 25 construction firms registered with the Federation of Construction Industry (FOCI) operating within Abuja metropolis. Data were collected using structured questionnaire. Analysis of data was carried out using Relative Importance Index (RII) and Mean Item Score (MIS). The study identified 12 important H&S Training practices (average RII = 0.813) which are averagely complied with (average MIS = 4.067). 7 important Regulations identified have significant impact on H&S performance of construction firms (average MIS = 4.08). 15 effective strategies were identified for reducing the rate of accidents, injuries and fatalities on construction sites (average MIS = 3.84). It was concluded that the level of compliance to H&S training practices among medium sized construction firms in Abuja, Nigeria is not effective. It was thus recommended that medium sized construction firms should implement the suggested strategies to the latter in order to create a conducive atmosphere for both management and workers to be able to implement the H&S regulation and training practices for enhanced H&S performance.*

**Keywords:** *Construction, Effectiveness, Health, Safety, Training.*

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## INTRODUCTION

Health and Safety (H&S) training is one of the most widely adopted practices to improve workplace safety. Every year, construction firms invest millions of dollars towards training the workforce on issues such as hazard recognition, risk management, and injury prevention (Al-Emran *et al.*, 2016). H&S is an inevitable aspect of construction due to its nature of being made up of the conglomerations of people from diverse backgrounds and disciplines with each individual's output determining the level of success to be recorded at each construction stage (Dodo, 2014). The importance of providing safe workplace has been reiterated by various related studies because of the intrinsic hazard and risk factors that undoubtedly underlie every work situation and their negative impact on a company's overall performance (Olutuase, 2014). The construction industry has been identified with the highest occurrence rate of accidents compared to any other industry (Williams *et al.*, 2018). In the recent past, death tolls, permanent disability, partial disability and some other severe environmental threat had increasingly been on the rise through collapse of buildings and other major operational accidents (Williams *et al.*, 2018). In addition, contractors often replace their workers and since it is an open environment, workers are prone to diseases.

One in six fatal accidents at work occurs in a construction site (Gracia, Ramos, Peiró, Caballer, & Sora, 2011). Although an analysis of the patterns and causation of accidents provides the basic information for safety planning, it is not sufficient for predicting when and where they will occur. Such prediction needs coordination with other branches of project management (Yi and Langford, 2006). The fact that a construction job or work environment is considered as highly risky and hazardous does not mean that its susceptibility to accident is not controllable – this largely depends on “work situation” which is humanly controllable. Several research articles have focused on evaluating and developing effective safety training interventions (Burke *et al.*, 2011; Weidman *et al.*, 2015, David and Saviley, 2015; Mostafa *et al.*, 2016). Ironically, research in construction safety continues to show alarming deficits in safety knowledge among construction workers (Baldwin, Hart, Gutteridge, & Ford, 1994; Cromwell and Kolb 2004; Haslam *et al.*, 2005) while few studies have focused on

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understanding why training efforts fail in construction (Goldenhar et al., 2001; Zhou, Fang, & Wang, 2008; Demirkesen and Arditi 2015). Most safety training programs within construction use conventional classroom techniques that do not sufficiently engage workers (Haslam, 2004; Haslam *et al.*, 2005; Wilkins 2011). More recently, Mostafa *et al.* (2016) argued that engaging safety training methods that facilitate dialogue, feedback, and action can result in higher learning gains. In similar thought, Shittu *et al.* (2016) and Shittu (2016) H&S Education and Training is the practice with the highest likelihood of improving the safety performance of construction firms out of the five core and modern H&S practices identified (Education and Training, Communication, H&S Planning, Workers' Consultation and Participation and Company's Commitment). Existing H&S literature focuses on the training of workers in large sized construction firms in the developed nations. This leaves out issues of H&S training of workers in the medium sized construction firms which makes a sizeable proportion of construction firms in Nigeria as reported by Shittu *et al.* (2016). The result of this is the problem of poor safety performance in the form of higher rate of accident, fatalities and injuries to workers on construction sites. However, there is a dearth of research in construction literature in the context of medium construction firms that are typically smaller than the large construction firms and yet they collectively perform a large portion of the construction volume and train a large number of workers on safety issues. It is thus imperative to fill this gap by evaluating the effectiveness of H&S training practices of medium sized construction firms in Abuja, with a view to proposing strategies for reducing accidents on construction sites. In order to achieve this aim, the following objectives were pursued:

- i. To identify the regulations capable of enhancing the effectiveness of H&S training practices of medium sized construction firms.
- ii. To identify the components of the H&S training practices capable of enhancing safety awareness among construction workers.
- iii. To examine the level of compliance of firms to the provision and implementation of the identified components of H&S training practices capable of enhancing safety awareness among construction workers.
- iv. To determine the impact of the identified H&S Regulations and training practices on the safety performance of construction firms.

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- v. To propose strategies for reducing the rate of accidents, injuries and fatalities on construction sites.

## **Regulations capable of enhancing effectiveness of H&S training practices of construction firms**

According to Chudley and Greeno (2006), Famakin and Fawehinmi (2007), construction regulations are statutory instruments setting out the minimum legal requirements for construction works and relate primarily to the health, safety and welfare of the workforce which must be taken into account when planning construction operations and during the actual construction period. Smallwood and Haupt (2006) reported that the Construction Regulations promulgated in the Republic of South Africa require a range of interventions by clients and designers. Smallwood and Haupt (2006) added that in order to have a safe and smooth construction environment and process, legal requirements must be met, the client must ensure that appropriate resources and organisation are in place, the health and safety reports must routinely inform the project board and the client must lead from the front, embedding the policies through the organisation. The components of effective H&S management system, according to Alberta (2006) are management leadership and organisational commitment through H&S Education and Training; roles and responsibilities; management commitment; employee participation; hazard identification and assessment process; determine controls; hazard control; enforcement of controls and emergency response plan. In addition, Mohammed (2010) reported that construction regulations must incorporate a provision that the contractor who plans to perform any construction shall, before carrying the work, notify in writing the competent authority for construction planning, particularly if the construction work includes use of explosives, dismantling of fixed plant, excavation work. In view of these, the various regulations capable of enhancing the effectiveness of H&S training practices are summarised in Table 1.

*Table 1: H&S Regulations Capable of Enhancing the Effectiveness of H&S Training Practices*

S/No	H&S Regulations	Source(s)
1	H&S Provision in Condition of Contract	Famakin and Fawehinmi (2007), Shittu <i>et al</i> (2015), Shittu <i>et al</i> (2016), Shittu (2016)

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2	H&S Provision in Worker Compensation Act	Shittu <i>et al</i> (2015); Shittu <i>et al</i> (2016); Shittu (2016)
3	H&S Provision in Factories Act 1990	Shittu <i>et al</i> (2015); Shittu <i>et al</i> (2016); Shittu (2016)
4	H&S Provision in Public Health Act 1990	Shittu <i>et al</i> (2015); Shittu <i>et al</i> (2016); Shittu (2016)
5	NSR&EA Act 2007	Shittu <i>et al</i> (2015); Shittu <i>et al</i> (2016); Shittu (2016)
6	National Building Code 2006	Shittu <i>et al</i> (2015); Shittu (2016)
7	H&S Provision in Labour, Safety & Welfare Bill 2012	Shittu <i>et al</i> (2015); Shittu <i>et al</i> (2016); Shittu (2016)

*Source: Researcher's Literature Compilation (2019)*

## **Components of H&S training practices capable of enhancing safety awareness among construction workers**

The activities of the construction industry have raised serious H&S concerns amongst governments, H&S stakeholders, H&S professionals and researchers over the past few decades (Kheni, 2008). In addition, Agumba and Haupt (2014) reported that H&S performance measurement can be broadly classified in to two: lagging indicators and leading indicators or positive performance indicators. Unfortunately, the construction industry continues to greatly depend on the traditional lagging indicators such as accident and workers compensation statistics. With the use of leading indicators, a more thorough and constant surveillance is required than when lagging indicators are used. Changes can be made and interventions introduced early to redress the weakness before accidents occur as a result of the adoption of leading H&S indicators in construction. Hence, the use of leading indicators instead of lagging indicators is increasingly advocated (Gambatese, Behm, & Hinze, 2005). It was therefore established by Agumba and Haupt (2014) that for H&S performance to improve, the corporate H&S culture should comprise H&S commitment, H&S, sub-contractors involvement, H&S accountability and disincentives and above all H&S training. Past researches have shown that certain training practices can lead to improved H&S performance and therefore constitute good H&S practices. The findings of these researches as summarised from the review of literature in this study are presented in Table 2.

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Table 2: Summary of Researches on H&S Training Practices

S/No.	H&S Training Practices	Source(s)
1	Safety inductions	Kheni (2008); Shittu <i>et. al.</i> (2015)
2	Safety training and orientations	Kheni (2008); Agwu (2012(a)); Shittu <i>et. al.</i> (2015)
3	Alcohol- and substance-abuse programme	Kheni (2008); Shittu <i>et. al.</i> (2015)
4	Training and retraining of employees on safe work procedure	Kheni (2008); Agwu (2012(b)); Shittu <i>et. al.</i> (2015)
5	Safety policies and procedures	Agumba and Haupt (2014)
6	Fire protection programme	Kheni (2008); Agwu (2012(b)); Shittu <i>et. al.</i> (2015)
7	Detailed safety programmes	Kheni (2008); Agwu (2012(b)); Shittu <i>et. al.</i> (2015)
8	Safety meetings	Kheni (2008); Agwu (2012(b)); Shittu <i>et. al.</i> (2015)
9	Communicating safety value to corporate stakeholders and Two-way safety communication	Agwu (2012(a)); Shittu <i>et. al.</i> (2015)
10	Focusing of monthly safety meetings on employees' attitudinal change towards safety	Kheni (2008); Shittu <i>et. al.</i> (2015)
11	Use of posters and other signs to give safety education	Shittu <i>et. al.</i> (2015); Shittu <i>et al.</i> (2016)
12	Use of external assistance with respect to health and safety issues	Shittu <i>et. al.</i> (2015); Shittu <i>et al.</i> (2016)

Source: Researcher's Literature Compilation (2019)

Strategies for reducing the rate of accidents, injuries and fatalities on construction sites



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H&S has been identified as a parameter which should be used along with the traditional parameters: cost, quality and time, to measure the success of projects. The reasons for considering safety and health are human factor, legislation and financial issues (Adan, 2004). According to Grace *et al.* (2014), the following H&S Measures are proactive strategies for reducing the rate of accidents, injuries and fatalities on construction sites: Site Layout and Planning; Personal Protective Equipment (PPE); First aid Kits and Accident Reporting; H&S Warning Signs; and Safety Policy. Peter *et al.* (2016) shows that there was a lack of commitment from the government, the insurance company, the labour ministry, the owners, consultants, and the contractors to improving safety performance on the construction sites. Although calls have been made to the stakeholders in the industry to improve their H&S performance, the number of fatalities and injuries arising from construction activities across the country as at today is highly worrisome. Peter *et al.*, (2016) suggested a shift in thinking where the focus is on those actions that can lead to good safety performance, for a better approach is to focus on proactive efforts dealing with the factors responsible for such accidents and injuries and how to control them.

## RESEARCH METHODOLOGY

This research employed the use of the quantitative approach. Data were collected using structured questionnaire. Analysis of data was carried out using the descriptive method of analysis. The population for the study constitutes the number of construction firms registered with the Federation of Construction Industry (FOCI) operating within Abuja metropolis. The register of FOCI has 25 construction firms registered with Abuja's business address. This constitutes the population size for the study. Data collected were be analysed using Relative Importance Index (RII) and Mean Item Score (MIS). The response of the respondents, on the RII and MIS analyses, will be ranked and analysed based on the cut-off points presented in Table 3.

Table 3: Cut- off points to responses

Scale	Cut-off points RII	Cut-off points MIS	Remarks/ Decision		
			Compliance	Significance	Effectiveness
5	8.81 - 1.00	4.50 - 5.00	Total compliance	Very Significant	Very Effective
4	0.61 - 0.80	3.50 - 4.49	Average compliance	Significant	Effective

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3	0.41 - 0.60	2.50 - 3.49	Partial compliance	Less Significant	Less Effective
2	0.21 - 0.40	1.50 - 2.49	Least compliance	Least Significant	Least Effective
1	0.01 - 0.20	1.00 - 1.49	Non compliance	Not Significant	Not Effective

Source: Adapted and modified from Morenikeji, (2006); Agumba and Haupt, (2014); Shittu et al., (2016)

The study of Agumba and Haupt (2014) identified core H&S practices of small and medium sized construction firms in South African construction industry, while Shittu et al. (2016) identified 5 core H&S practices of small and medium sized construction firms in Nigerian construction industry. These studies used a bench mark of above 3.00 for good or important H&S practices which is far above average on a 5- point scale. The choice of this was based on the fact that H&S is a very sensitive issue where error margin should be the barest minimum. This justifies the adoption of similar cut-off point for this study.

## RESULTS AND DISCUSSIONS

### Level of compliance to the provision and implementation of the components of H&S training practices capable of enhancing safety awareness among construction workers

The study identified 12 important H&S Training practices (average RII = 0.813). The result of the MIS on the level of compliance to these training practices is presented in Table 4.

Table 4: MIS Ranking on Compliance to H&S Training Practices

S/NO	COMPONENTS OF H&S TRAINING	MIS	RII	RANK	DECISION
1	Safety policies and procedures	4.280	0.856	1st	Average Compliance
2	Safety meetings	4.280	0.856	1st	
3	Communicating safety value to corporate stakeholders and Two-way safety communication	4.240	0.848	3rd	Average Compliance
4	Safety inductions	4.200	0.840	4th	Average Compliance

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5	Training and retraining of employees on safe work procedure	4.160	0.832	5th	Average Compliance
6	Fire protection programme	4.120	0.824	6th	Average Compliance
7	Detailed safety programmes	4.080	0.816	7th	Average Compliance
8	Focusing of monthly safety meetings on employees' attitudinal change towards safety	4.040	0.808	8th	Average Compliance
9	Use of posters and other signs to give safety education	3.960	0.792	9th	Average Compliance
10	Use of external assistance with respect to health and safety issues	3.960	0.792	9th	Average Compliance
11	Alcohol- and substance-abuse programme	3.880	0.776	11th	Average Compliance
12	Safety training and orientations	3.600	0.720	12th	Average Compliance
	<i>Average</i>	<i>4.067</i>	<i>0.813</i>		Average Compliance

Source: Researchers' Analysis of Data (2019)

Table 4 shows that all the identified H&S training practices identified are averagely complied with by the construction firms. These range from "safety training and orientation" (MIS = 3.60) to "Safety policies and procedures/safety meetings" (MIS = 4.28). The average MIS is 4.067. This implies that the construction firms should improve their level of compliance. The finding of this study here agrees with that of Agumba and Haupt (2014) and Shittu et al. (2016) where it was established that for H&S performance to improve, the corporate H&S culture should comprise H&S commitment, H&S, sub-contractors involvement, H&S accountability and disincentives and above all H&S training.

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## Impact of H&S Regulations and training practices on safety performance of construction firms

The study identified 7 important Regulations for enhancing the H&S performance of construction firms. These are H&S Provision in Labour, Safety & Welfare Bill 2012; National Building Code 2006; H&S Provision in Workmen Compensation Act; NESREA Act 2007; H&S Provision in Public Health Act 1990; H&S Provision in Condition of Contract; and H&S Provision in Factories Act 1990 with RII ranging from 0.768 – 0.888. The MIS results on the impact of these Regulations on the performance of construction firms is summarised in Table 5.

*Table 5: Impact of H&S Regulations on H&S Performance of Construction Firms*

S/NO	IMPACT OF H&S REGULATION ON SAFETY PERFORMANCE	MIS	RANK	DECISION
1	Increased labour turnover	4.280	1st	Significant
2	Operational inefficiency and ultimately decreasing performance become noticeable	4.120	2nd	Significant
3	High costs in the areas of hospital bills	4.080	3rd	Significant
4	Salaries for hospitalised workers and compensations	4.040	4th	Significant
5	Absenteeism	4.000	5th	Significant
6	Strained management-labour relationship	3.960	6th	Significant
	<i>Average</i>	<i>4.080</i>		Significant

*Source: Researchers' Analysis of Data (2019)*

It was shown from Table 5 that the identified H&S Regulations have significant impact on the H&S performance of construction firms (average MIS = 4.08). The most significant impact of H&S Regulation on H&S performance of firms is "Increased labour turnover" with MIS of 4.28 while the least significant is "Strained management-labour relationship" with MIS of 3.96. The MIS results on the impact of H&S training practices the performance of construction firms is summarised in Table 6.

*Table 6: Impact of H&S Training Practices the Performance of Construction Firms*

S/NO	IMPACT OF H&S TRAINING PRACTICES ON SAFETY PERFORMANCE	MIS	RANK	DECISION
1	Shortage of knowledge and training	3.440	1st	Less Significant

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2	Lack of supervision	3.160	2nd	Less Significant
3	Biological agents	3.040	3rd	Less Significant
4	Awareness about the safe implementation of assigned work	3.000	4th	Less Significant
5	Ergonomic hazards	3.000	4th	Less Significant
6	Large financial losses	2.960	6th	Less Significant
7	Lack of knowledge and pattern of illness	2.920	7th	Less Significant
8	Apathy and total carelessness	2.840	8th	Less Significant
9	Mechanical	2.800	9th	Less Significant
10	Exposure to harmful chemicals	2.720	10th	Less Significant
11	Physical	2.680	11th	Less Significant
	Average	2.960		Less Significant

Source: Researchers' Analysis of Data (2019)

Table 6 revealed that the H&S training practices identified have less significant impact on the safety performance of medium sized construction firms. These impacts range between "Shortage of knowledge and training" and "Physical impact" (MIS = 3.44 and 2.68 respectively). This agrees with findings from literature (Famakin and Fawehinmi, 2007; Shittu *et al.*, 2015; Shittu *et al.*, 2016; Shittu, 2016) which state that small and medium sized construction firms have peculiar H&S challenges.

## Strategies for reducing the rate of accidents, injuries and fatalities on construction sites

The MIS result of the 15 identified strategies for reducing the rate of accidents, injuries and fatalities on construction sites is presented in Table 7.

Table 7: Strategies for reducing the rate of accidents, injuries and fatalities on construction sites

S/NO	STRATEGIES FOR REDUCING ACCIDENT RATES	MIS	RANK	DECISION
1	Supervision	4.200	1st	Effective
2	Health and Safety Warning Signs	4.080	2nd	Effective
3	Risk Management	4.080	2nd	Effective
4	Financial Provision for H&S	4.040	4th	Effective
5	Effective Communication	4.040	4th	Effective
6	Partnering	4.040	4th	Effective
7	Safety incentives	4.000	7th	Effective

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8	Proper Equipment	3.960	8th	Effective
9	Safety record keeping and follow-ups	3.920	9th	Effective
10	Changes in the permanent design	3.880	10th	Effective
11	Personal Protective Equipment (PPE)	3.840	11th	Effective
12	First aid Kits and Accident Reporting	3.760	12th	Effective
13	Hazard Identification and Risk Assessments (HIRAs)	3.600	13th	Effective
14	Site Layout and Planning	3.560	14th	Effective
15	Safety Policy	3.400	15th	Less Effective
	Average	3.893		Effective

Source: Researchers' Analysis of Data (2019)

It was shown from Table 7 that the strategies identified for reducing the rate of accidents, injuries and fatalities on construction sites are effective (average MIS = 3.893). The most effective strategy is "Supervision" (MIS = 4.20) while the least effective one is "safety policy" (MIS = 3.40). This agrees with the study of Grace *et al.* (2014) that these H&S measures are proactive strategies for reducing the rate of accidents, injuries and fatalities on construction sites.

## CONCLUSION AND RECOMMENDATIONS

In view of the research findings it can be concluded that H&S training practices are not completely complied with by medium sized construction firms in Nigeria. The H&S Regulations has significant impact on safety performance of construction firms, while H&S training practices have less significant impact on safety performance of construction firms. The strategies for reducing the rate of accidents, injuries and fatalities on construction sites are effective. It is therefore clear that the level of compliance to H&S training practices among medium sized construction firms in Abuja, Nigeria is not effective.

In view of the conclusion of the study, the following recommendations are made:

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- i. Medium sized construction firms should adopt the relevant H&S provisions in the identified H&S Regulations especially "H&S Provision in Labour, Safety & Welfare Bill 2012" and "National Building Code 2006" in order to formulate their H&S policies in order to increase the level of compliance with H&S training practices,
- ii. Medium sized construction firms should implement the suggested strategies to the latter in order to create a conducive atmosphere for both management and workers to be able to implement the H&S regulation and training practices for enhanced H&S performance.

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*Shitoh A.A.*

OF: *Dept. of Quantity Surveying, School of  
Environmental Tech. Fed. University, Minna*

**PARTICIPATED AND PRESENTED A PAPER**

TITLED: *EVALUATION OF THE EFFECTIVENESS OF  
HEALTH & SAFETY TRAINING PRACTICES IN  
ABUJA*

**THE 16TH INTER-DISCIPLINARY ACADEMIC CONFERENCE  
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