



Original Research Article

IMPORTANCE OF SPECIALIST HEALTH AND SAFETY TRAINING TO WORKERS IN CIVIL ENGINEERING CONSTRUCTION FIRMS

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ABSTRACT

Modern construction activities are performed with the most sophisticated technology. It is required by law that those who operate the tools and equipment should be informed of the risks and hazards associated with their use. This study aimed at investigating the extent civil engineering construction firms within the South-South Geopolitical zone of Nigerian conduct specialist health and safety (H&S) training for workers. Questionnaire survey was structured from literature and administered to workers with the aid of interpreters. Data obtained from the survey was analyzed with the aid of Statistical Package for Social Sciences (SPSS) Software. The findings revealed that there is a general lack of H&S training for construction site workers in the South-South Geopolitical zone of Nigeria, particularly among the indigenous civil engineering firms. The study recommends that specialist H&S training should be a top priority of civil engineering construction firms, bearing in mind the ever-increasing use of high-tech tools and plants in the sector.

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1. INTRODUCTION

The construction industry comprises both the building and civil engineering sectors. The industry plays an important role in the economy of any nation. According to the Health and Safety Executive (HSE) (2010), the industry is so important that almost all other sectors of the economy in one way or the other depend on its products or services. The construction sector is also considered to be the second highest employer of both skilled and unskilled workers, after agriculture (Luria, 2011). Despite its economic importance to national development, the sector is noted for its high rate of site fatalities and injury cases.

The rate of site fatalities in construction is seven times more than manufacturing-based industries (Bell and Healy, 2006). Goetsch (2014) identifies falls from height, slips, machinery and transportation accidents, and

electrocution as the main causes of site accidents. Fewings (2010) also identifies stepping or striking against small objects, sprains and strains as common on construction sites.

In terms of lost workday cases, construction is one of the highest of all industries, with over 60% of the cases emanating through musculoskeletal injuries (ILO, 2010). Accidents and incidents in the construction industry cost national economies nearly over 4-5% of the gross domestic product (GDP), and there is an urgent need for an improvement (HSE, 2010). Brauer (2006) argued that workers are the most valuable asset of any organization; therefore, their H&S training should be a necessity and not a privilege.

The accidents that went unreported could be higher bearing in mind that 90% of construction site workers are rural migrant workers with no basic education (Okorie and Aigbavboa, 2016). In addition, research conducted in United Kingdom (UK) by Health and Safety Executive (HSE) has shown that the accidents reporting level in construction industry is only at 55% (HSE, 2010). Perhaps, there is a need to create awareness and empower workers through H&S training.

Many have argued that the nature and complex operations of the construction industry combined to engendered site accidents and incidents. Hughes and Ferrett (2010) have added types of tools, equipment and machineries as factors contributing to site injuries and fatalities. However, other researchers have stated that the uniqueness and complexity of the industry should not be an excuse for the wanton destruction of precious human lives and property Brauer (2006); Geotsch (2014). The ILO (2010) on their part unequivocally stated that it is a right for every worker who goes work to return home without losing an arm or a limb.

Internationally and in Nigeria, researchers have shown that poor site H&S performance is often attributed to a low level of 'respect for people' in the construction industry, where the workforce is treated as an instrument to attain organisational goals (Luria, 2011). Regrettably, inappropriate H&S training of operators and workers in safety knowledge and safe operating procedures were found to be contributing factors to high risk industries (Bell and Healy, 2006). H&S training of workers and operators as argued by Hughes and Ferrett (2010) plays a key role in the development of awareness and understanding of the specific hazards and risks in the work environment. Therefore, it is the right time to rethink and have a change of attitudinal behaviour towards workers' H&S training.

Thus, the aim of this study was to investigate the extent civil engineering construction firms conduct specialist H&S training for plant operators and workers in the South-South Geopolitical zone of Nigeria and recommend strategies/measures that would help to improve specialist H&S training for this category of construction site workers.

2. METHODOLOGY

2.1. Study Location

Edo State, Delta and Rivers States were chosen from the South-South Geopolitical zone for the study because of their significant place in commerce and industrial activities within the zone. The commercial and industrial activities of these States called for high demand of civil engineering works. Edo State is an inland state in central southern Nigeria. Its capital is Benin City. It is bounded in the north by Kogi State, in the south by Delta State and in the west by Ondo State. The State lies roughly between longitudes 05° 04'E and latitudes 05°44'N and 07°34'N. It has an area of about 19,794 square kilometers. Delta State lies roughly between longitudes 5° 46 and 6° 45'E and latitudes 5° 38 and 6° 30'N. It has a total land area of 16,842 sq. km. It is bounded in the north and west by Edo State, the east by Anambra and Rivers States, southeast by Bayelsa State, and on the southern flank is the Bight of Benin which covers about 160 kilometers of the state's coastline. Rivers State has a total area of 11,077 km² (4,277 mi²), making it the 26th largest state in Nigeria.

The State is bounded by the Atlantic Ocean in the South, Imo State in the North, Akwa Ibom to the east and Bayelsa to the west. Rivers State lies between longitudes 06° 49' 39E and latitudes 04°44' 59N. The State has grown from a fishing settlement to become one of the important economic hubs of Nigeria.

2.2. Data Collection

The data employed for this study were collected through the use of questionnaire administered to 210 construction site workers with the aid of interpreters where necessary. The respondents comprised of artisans and unskilled workers. The data were derived from questions on general and specialist H&S training, interval of conducting general and specialist H&S training, language used in conducting H&S training and its effectiveness, frequency of artisans' involvement in site accidents, nature of site accidents involved by artisans and causes of construction site accidents. Data obtained from the completed questionnaire survey was analysed with the aid of Statistical Package for Social Sciences (SPSS).

2.3. Research Method

Three States, Edo, Delta and Rivers were selected in the South-South geopolitical zone of Nigeria for the study. The rationale for the choice of the three States was informed by the fact that they are most economically viable states in the zone. In addition, infrastructure works are ongoing in the States which made the Civil Engineering firms busier than in other States in the zone. Ten Civil Engineering firms were randomly selected from each State to participate in the study resulting in a total of thirty (30) firms. The specialist operators surveyed were: crane operators, Bulldozers operators, Excavator operator, Grader operators, Concretors, Carpenters and Welders. Structured questionnaires were administered to the selected operators' and workers. Since most of the general workers are illiterate, interpreters were employed where necessary. On the whole, two hundred and ten (210) questionnaires were distributed, but one hundred and fifty-three (153) were returned, corresponding to a response rate of 73%. However, only one hundred and thirty-eight (138) that is 66% were properly completed and could be used for the analysis. The response rate achieved for this research is similar to that achieved in other surveys (Sutrisna, 2009; Collins, 2008). It could be inferred from Dainty (2008) and Sutrisna (2009) that performing a statistical analysis in survey of this rate is acceptable. Thus, 66% response rate achieved in this survey provides reasonable data for analysis. Data obtained from the completed questionnaire survey was analysed with the aid of Statistical Package for Social Sciences (SPSS).

3. RESULTS AND DISCUSSION

Table 1 shows the characteristics of the respondents to the questionnaire. The respondents cut across the nine work sections surveyed with unskilled workers having the highest participants of 19.4%, followed closely by Welders with 12.3%, Carpenters with 16.5 % while Grader operators with 10.1%, while Concretor had the lowest representation of 9.4 %. As regards the years of working experience, 28.3% of the respondents have worked in the construction industry for between 16 and 20 years, 18.1% of them have worked for between 11 to 15years, while only 6.5% had working experience of between 1 and 5 years. Majority of the respondents were Senior Secondary School Certificate holders with 37.7% while 31.2% were holders of school leaving certificate (some respondents in this category were aided to fill the questionnaire through interpreters). Only the minority were holders of Higher National Diploma with 5.8% and the Bachelor of Science with 2.2%. This background indicates that the respondents were suitably qualified to supply the information required of them as they have sufficient work experience and required academic qualification to understand and answer the questions asked from them.

Table 2 shows the frequency of general and specialist H&S training as indicated by the respondents. Majority of the respondents (56.5%) indicated that their firms frequently conduct general H&S training for them while 41.3% indicated that their organizations rarely conduct general H&S training for the workers and operators,

while only 2.2% opined that they never attended general H&S training in their firms. However, 3.6% of the respondents indicated that their firms never organize specialist H &S training. The 60.9% of the sampled firms rarely conduct job specialist H&S training for their operators while only 35.5% frequently organize specialist H&S training for their operators.

Table 1: Summary of characteristics of questionnaire respondents

Category	Classification	Frequency	Percent
Job type	Crane operator	17	12.3
	Bulldozer operator	15	10.9
	Excavator operator	18	13.0
	Grader operator	14	10.1
	Concretor	13	9.4
	Carpenter	20	16.5
	Welder	17	12.3
	Unskilled workers	24	19.4
Total		138	100
Years of experience	1-5	9	6.5
	6-10	18	13.0
	11-15	25	18.1
	16-20	39	28.3
	21-25	24	17.4
	Above 25	23	16.7
Total		138	100
Academic qualification	School leaving Certificate	43	31.2
	SSCE	52	37.7
	OND	18	13.0
	NCE	14	10.1
	HND	8	5.8
	BSc/ BTech	3	2.2
	Total	138	100

Table 2: Frequency of general and specialist H& S training

	Never		Rarely		Frequently	
	F	%	F	%	F	%
Frequency of general H&S training	3	2.2	57	41.3	78	56.5
Frequency of specialist H&S training	5	3.6	84	60.9	49	35.5

Key: F= Frequency

Table 3 shows the responses of the respondents on the intervals at which their firms conduct general and job specific H&S training. It was found that 12.3% indicated that their firms' conduct general H&S training daily, 31.9% indicated that their firms conduct general H &S training weekly, 23.2% bi-monthly while 13.0% and 19.6% of the surveyed firms conduct general H&S training monthly and no fixed interval respectively. The respondents indicated that majority of the firms' conduct specialist H&S training for their operators at no fixed intervals (85.5%). While only 5.1%, 8.0% and 1.4% conduct specialist H &S training monthly, bi-monthly and weekly respectively. No Civil engineering firm in the study area conduct H&S training weekly.

Table 4 shows that majority (68.3%) of the firms surveyed conduct their H&S training in English language which the respondents rate its effectiveness lower (3.74) compared to 31.7% which conduct their H&S training in local languages with effectiveness rate of 4.52.

Table 3: Interval of general and specialist H&S training

	Daily		Weekly		Bi-monthly		Monthly		No fixed interval	
	F	%	F	%	F	%	F	%	F	%
Frequency of general H&S training	17	12.3	44	31.9	32	23.2	18	13.0	27	19.6
Frequency of specialist H&S training	0	0	2	1.4	11	8.0	7	5.1	118	85.5

Table 4: Language used in conducting H& S training and its effectiveness

Language	Percentage	Effectiveness (MIS)
English language	68.3	3.74
Local languages	31.7	4.52

Table 5 shows the frequency of artisans' involvement in site accident from the surveyed result. It was found that 16.7% of the respondents have never been involved in site accident while 45.6% indicated they were rarely involved in site accidents, against 37.7% who indicated that they frequently involved in site accidents.

Table 5: Frequency of Artisans involvement in site Accident

Never		Rarely		Frequently	
F	%	F	%	F	%
23	16.7	63	45.6	52	37.7

Table 6 shows the result of nature of accidents that operators working with Civil Engineering firms in the study area usually involved were based on the work section surveyed. From the total operators and unskilled workers surveyed: 10.4% of crane operators have been involved in minor site accident while 1.7% have been involved in major accident. It was also found that 8.7% of bulldozer operators have been involved in minor site accidents while 0.9% of them have been involved in major site accidents. From the results, it was found that 8.7%, 7.0%, 16.6, 13.0% and 15.7% of the respondent are excavator operator, grader operator, concretor, carpenter and welders respectively have been involved in minor site accidents while only 4.3%, 3.5%, 0%, 5.2% and 4.3% respectively have been involved in major site accidents. On the whole, 1 out of every 5 (20%) of civil engineering construction firm's worker had been involved in major site accident.

Table 6: Nature of site accident involve in by artisan

Job Description (Operators)	Nature of Accident				
	Minor		Major		
	F	%	F	%	
Crane operator	12	10.4	2	1.7	
Bulldozer operator	10	8.7	1	0.9	
Excavator operator	10	8.7	5	4.3	
Grader operator	8	7.0	4	3.5	
Concretor	19	16.5	0	0	
Carpenter	15	13.0	6	5.2	
Welder	18	15.7	5	4.3	
Total	92	80.0	23	20.0	

Table 7 shows the result of causes of accident on civil engineering construction site as indicated by the respondents. Lack of inadequate specialist H & S training (MIS=4.65), ineffectiveness of language use in conducting H&S training (MIS=4.25) and lack of top management commitment to H&S (MIS=4.15) were rated 1st, 2nd and 3rd respectively as the most important factors responsible for site accidents. On the contrary, acts of God (MIS=2.58), negligence on the path of operators (MIS=2.78) and poor supervision (MIS=2.87) were rated 7th, 6th and 5th respectively as factors that least responsible for site accidents on civil engineering construction sites.

Table 7: Causes of accidents on construction sites

Causes of accident	Mean item score	Ranking
Lack of/ Inadequate job specific H&S training	4.65	1
Ineffectiveness of H&S training language	4.25	2
Lack of top management commitment to workers H&S	4.15	3
Inadequate general H&S training	3.56	4
Poor supervision	2.87	5
Negligence on the path of artisans	2.78	6
Acts of God	2.58	7

Majority of civil engineering firms, particularly the indigenous one hardly conduct specialist H&S training for their operators and workers. The findings of this study corroborated the work of Bell and Healy (2006) that inappropriate H&S training of operators and workers in safety knowledge and safe operating procedures were found to be contributing factors to high risk industries. It was noted that specialist H&S training required the use of plants, tools and machineries which may be expensive for indigenous firms. However, this should not be an excuse for the wanton destruction of lives and properties. The language used to conduct H&S training is major determinant of its effectiveness. The 3.74 rating of the effectiveness of English language as the major language of conducting H&S training is low compared to 4.52 effectiveness rating of local languages to conduct H&S training even though only 31.7% of the civil engineering firms in study area used local languages to conduct their H&S training. The importance of specialist H&S training for construction site workers required management to hire the services of multi lingual supervisors who are responsible of mentoring, supervising and training of workers in all aspects of workplace health, safety and wellbeing.

4. CONCLUSION

The study has shown that H&S training of construction site workers are not only beneficial to construction firms, but also to workers who are most at risk. Inappropriate H&S training of workers and operators in the use of safe procedures engendered poor site H&S performance. Lack of management commitment to workers' health, safety and wellbeing is a serious challenge to effective H&S management in the construction industry worldwide. Since, H&S training of workers and operators is morally, legally, socially and economically essential for successful survival of construction firms, it becomes imperative for all categories of civil engineering contractors to invest in training retraining of both site workers and operators in site H&S. Based on these findings, we conclude that, there is a need for specialist H&S training of construction site workers and operators to improve their skills, competencies and awareness level on the existence of risks and hazards in the work environment. It is proven maxim that H&S training of workers and operators is the most powerful instrument through which the H&S cultural change can take place among the workforce.

5. CONFLICT OF INTEREST

There is no conflict of interest associated with this work.

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