CLIENTS CONTRIBUTION TO ENHANCING SAFETY PERFORMANCE ON CONSTRUCTION SITE ABUJA

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ABSTRACT

It is important for the stakeholders in the construction industry to ensure that adequate protection against injuries and illness is provided to the construction workers safety while at work. Clients have been identified as one of the major stakeholders. Client stands a better chance of gaining accident free construction site, as cost of construction accidents and the legal liabilities in relation to workers' injuries will no longer be an issue of concerned to them. However, little has been written about Nigerian client influence of construction site safety performance. This paper attempts to explore the contribution of Nigerian client in enhancing construction site safety with a view to improve construction site safety performance. The study largely derives mixed research approach and is a criteria – based research in which 44 Project Managers (PM) were selected for the study following the rules of Krejcie and Morgan, (1970). The administered questionnaire on the 44 PM's were analyzed using the statistical package for social science (SPSS) version 20. The result of the correlation analysis shows that influence of the client on safety performance is significant. Also, the result of regression analysis shows that client influence on construction site safety and health measures improves construction sites safety standard. It can be concluded that the client's involvement significantly influence project safety performance. Clients can help improved safety performance by implementing a carefully designed, dynamic safety program. These programs can serve as a viable model for other construction stakeholders to emulate.

Keyword: client, performance, project, safety and health.

1. INTRODUCTION

According to Xiaohua J, Guomin Z, Junxiao L, Yingbin T and Jian, Z (2017). A variety of stakeholders is involved in any construction project. Major participant including design teams, clients, contractors and project managers are examples of stakeholders that have the abilities to hinder or promote the progress of a construction undertaking. Therefore, it is important for the stakeholders in the construction industry to ensure that adequate protection against injuries and illness is provided to the construction workers safety while at work. Health and Safety in construction sites is influence by many factors such client attitude, contractors attitude, workers attitude etc. Hughes and Ferret (2007) defined health as the protection of the bodies and minds of people from illness resulting from the materials, processes or procedures used in the workplace while Safety is the protection of people from physical injury. The borderline between health and safety is ill defined and the two words are normally used together to indicate concern for the physical and mental well-being of the individual at the workplace (Hughes and Ferret, 2007).The client should also be remaindered of his duty as stipulated in section 17 of the Occupational Safety and Health Act (OSHA) 1994 (Duties of employers and self-employed to their employees). The act is peculiar to all commonwealth nation.

The philosophy of improving health and safety management by way of the regulations starts with an obligation to establish a team that will have the competence and resources to manage the project without any undue risk to health and safety. The appointment of a planning supervisor is central to a client's responsibilities. The planning supervisor should be appointed as early as possible to allow adequate time to address issues during the planning and design stage, including the preparation of the pre-tender stage health and safety plan. The application of high modern technology on construction project in construction industry has made the industry move from 3Ds to 4Ds that is dirty, difficult, dangerous and death. Said, I., Mohd,W..S., and Abdelnaser,O. (2009), traditionally, construction safety responsibilities mostly rest on the shoulders of contractors but nowadays, the clients are more willing to get involved in site safety discussions. Also according to Said, *et al.*, (2009) the clients have come to realize that the costs of construction accidents would ultimately be borne by them and they were able to recognize the fact that, after undergoing various painful learning experiences, they cannot disassociate themselves from the legal liabilities in relation to workers' injuries.

An ILO released report for Worker Memorial Day April 28, 2005 as contained in the Keller and Keller (2009) stated that at least 60,000 fatal workplace accidents occur each year worldwide in construction. These records exclude Nigeria, according to Orji, S.E, Enebe, E.C, and Onoh, F.E. (2016). that Nigeria do not have records of fatalities and non – fatalities from any construction sites. As the contractors do not report accidents at appropriate ministry nor keep proper records of accidents (Mba and Hilda, 2014). As the Department of Occupational Safety and Health (DOSH) in the Ministry of Labour and Productivity that is responsible for keeping accident records do not have or keep up to date records of accident. As a result of this event, clients started to place more importance on safety in their contractor selection criteria (Orji, *et al.*, 2016). They also insisted that contractors to allocate sufficient safety provisions in the construction contracts. Clients can successfully influence construction sites safety and health measures. Various regulations such as OSH Act and Factory and Machinery Act (FMA) require client to take safety and health issues to every stage of project such as planning, design, construction, maintenance and demolition. Such regulations include Employers safety and health general policy statement of 1995, Control of Industrial Major Accident Hazard of 1996, safety and health officer of 1997 etc. Though, by complying with those legislations and regulations, safety on construction sites can be improved, if reasonable in philosophy, adequate in detail and worded without ambiguity. Legislations and Regulations provided a basis for employment and enforcement of good construction practices. However, little has been written about Nigerian client influence of construction site safety and health measures and most literature are silent on client influence on enhancing safety and health on construction sites. As such, this paper attempts to explore the contribution of client in enhancing construction site safety with a view to improved construction site safety.

2. LITERATURE REVIEW

According to Haupt TC, Deacon C, and Smallwood JJ (2005) client influence has impact on construction health and safety on construction sites. A client can be any person or organization for whom a construction project is being carried out (Haupt *et al.*, 2005). However, Boyd and Chinyio (2006) broaden the definition to include representatives of the owner or act with delegated authority of the owner. The client must realize that the influence he has on safety and

health on construction site decreases with project evolvement as shown in Time/Safety curve developed by Szymberski (Farooqui RU, Ahmed SM, and Azhar N. 2008)

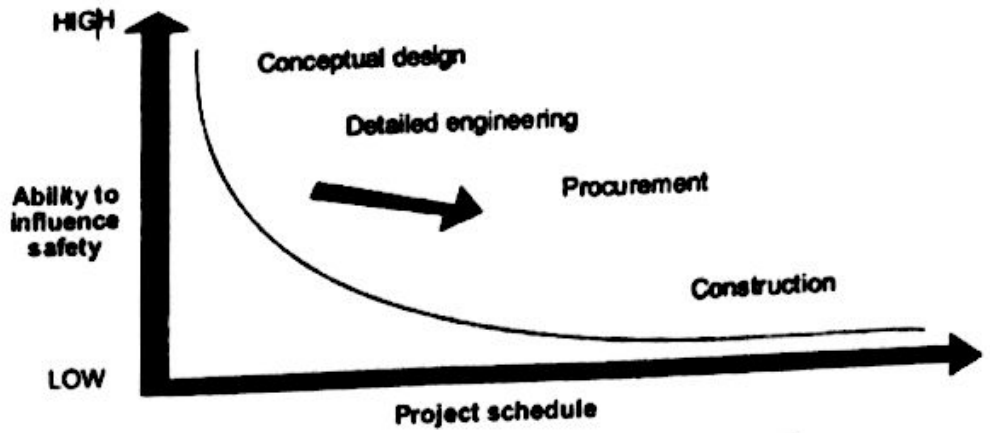

Figure 1, Time/safety influence curve

During the determination of the project's feasibility and development of the conceptual design the design stage, it is important to consider safety and health measures of a project as well as to eliminating potential hazards.

According to Fellows, R.; Langford, D.; Newcombe, R, and Urry, S (2002) the client must appoint a contractor who is competent and can build the project in a safe way. This may involve safety records being inspected as a qualification for selection of a tenderer. Some Clients do not believe that the provision of safety and health measures of construction site workers is their responsibility (Hislop 1999). Also, according to Smallwood (2002), the clients often assume that it is the responsibility of the contractors' to comply with the relevant environmental, safety, and health regulations. Hislop (1999), clients should have a vested interest in ensuring that an effective construction safety programme is in place on their job sites as any losses will ultimately be pay by them. Effective construction safety programme can lead to safer system of construction and reduce the incidence of injuries and work related diseases. Implementation construction safety programme is an important step that required real adaptation toward accident free site.

In other words, Fernández-Muñiz, B., Montes-Peón, JM., and Vázquez-Ordás, CJ. (2011). argued that safety policies and programmes constitute in themselves important components in employees' perceptions about the importance of safety in their workplaces, and consequently contribute to safe behaviours. More and more clients are getting more involved in the issue of safety at their construction sites. This may be due to high cost involved in payment on accident compensations to the victims and the legal liabilities in relation to worker's injuries. Also it is the client that stands a better chance of gaining accident free construction site, as cost of construction accidents and the legal liabilities in relation to workers' injuries will no longer be an issue of concerned to them. A study conducted by Coble (1992) and cited by Said, *et al.*, (2009) showed

that the average worker's compensation insurance cost could be conservatively estimated at 3.5% of the total project cost. In addition to the high costs of workers compensation payments, the higher dollar's value settlements in lawsuits, the increased amount of OSHA fines for safety violations, and the adverse impacts of poor safety performance on the corporate image should become the catalyst for all people concerned in the industry to increased safety on site. Said, *et al.*, (2009) concluded that clients can actively impact construction safety by selecting reliable contractors addressing safety issues in design and participating in safety management during construction. Client can actively address safety by engaging in the following activities;

1- Establish and communicate attitudes toward safety.
2- Consider safety in contractors selection
3- Develop contractual safety arrangements
4- Address safety during design and constructability review
5- Participate in safety dialogues during construction
6- Implement total safety culture and behavior-based safety.

Any client that take part in the above activities will not only reduced the number of severity accidents but will also reduce their total liability exposures.

3. MATERIALS AND METHODS

The choice of research methodology to be adopted in research work depends largely on what the researcher intent to achieve. This paper attempts to explore the contribution of client in enhancing construction site safety with a view to improving construction site safety. The study largely derives mixed research approach that is qualitative and quantitative. Qualitative research studies, how people view certain phenomenon such as attitudes, system value, culture or lifestyle (Mohammed, YD, Shamsul, BMT, and Bakri, MI. 2017). While quantitative research studies quantity of things, that is counting things in an attempt to explain what is observed. The research target populations are project managers. The study is a criteria – based, in which certain criteria were outline for the selection of the construction companies and their project managers. Those criteria are:

1. The construction companies must have been in operation for not less than 20 years.
2. The construction company must have a project manager with vast knowledge of construction site safety and health measures.
3. The construction companies must have an ongoing project.
4. The project must be building or civil engineering projects
5. The contract sum of such project must be above 1billion Naira. The construction companies handling such sum of project are usually large construction companies and are safety compliance.
6. The progress of the ongoing project must be between 25% - 75% completion.
7. The location of the study is Abuja, the Nigeria federal capital.

Fifty (50) construction companies were identified to have met the research criteria and were considered for this study. Fifty (50) Project Managers (PM) were identified with the construction companies that meet the study criteria. The selection of the PM's as the target population is due to the fact that they are the head or manager of the project and have direct link to the client.

Forty four (44) PM's were selected for the study following the rules of Krejcie and Morgan, (1970). In Krejcie and Morgan rules, for example, one may wish to know the sample size required to be representative of the opinions of 9000 high school teachers relative to merit pay increases. To obtain the required sample size enter Krejcie and Morgan Table at N = 9000. The sample size representative of the teachers in this example is 368. The Krejcie and Morgan Table are applicable to any defined population. The research questionnaires administered on 44 Project Managers contains questions about clients understanding of safety measures required to improved safety performance on construction site as well as clients commitment to the implementation of those safety measures.

Those entire questions were rank using five likat scale. Correlation and Regression analysis were used to analyze the data. Correlation determines the relationship between two variables while the regression determines the performance of one variable over another. Those analyses were undertaken using the statistical package for social science (SPSS) version 20.

4. REULTS AND DISCUSSION

1. Results (Correlation)

Correlation analysis was conducted in order to determine the relationship between clients influence and safety and health measures. Table 1, shows the result of clients influence and safety and health measures implementation on site obtained from questionnaire administered on PM's. The PM's have more than 15years working experience and with vast knowledge of safety on construction site. Also they are Members of Institute of Safety Professional (MISP).

Table 1 Average Client Influence (AVGCI)

Component	r	P
AVGCI	.360	.001

listwise N = 44

Where,
AVGCI= Average client influence
AVGSHM = Average safety and health measures

From Table 1 client influence in enhancing safety and health measures on construction sites have a Pearson's correlation (r) of 0.360 while it's P< .001. This means that as the level of client's safety and health enhancement on sites improves there is corresponding improvement on the sites safety and health measures.

2. Discussion (Correlation)

The finding from the analysis indicated a positive significant relationship between the clients influence and safety and health measures. The *r* (0.360) is significant and it has a positive value.

There is significant clients influence on safety and health measures on site, the positive relationship between clients influence and safety and health measures means that the higher the level of clients influence on safety and health measures the higher the safety and health standard on site.

1. Result (Regression).

Regression predicts outcome variables relationship from single predictor or from several predictors. As such this paper adopted a simple linear regression due to the fact that it seeks to examine the contribution of clients influence on safety and health measures on construction sites. As such clients influence is the dependent variable while safety and health measures are the independent variable. The result of simple linear regression analysis is presented in Table 2.

Table 2 Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.360[a]	.130	.127	.40853

a. Predictors: (Constant), AVGSHM

b. Dependent Variable: AVGCI

Table 2 shows that 13% (R^2 = 0.13) of the proportion of variation in clients influence is explained by the variation of safety and health measures on sites. The R^2 adjusted is 0.127 implying that the model explains 12% of the variation in the clients influence within the population leaving 88% unexplained. The level clients influence on sites did not explain the occurrence of such variation in the safety and health standard.

2. Discussion (Regression)

The enhancement of client safety performance on sites only contribute 12% to the safety performance on site leaving 88% to other factors such as project managers effort in safety performance implementation on sites, safety supervisors and workers contribution to safety performance on site. Also, the regression model finding indicate that additional improvement on the level clients influence in enhancing safety on sites will spring up enormous benefit of the safety management system on the construction sites. From the models discussion of Table 2, some of the explanation of such can be deduced from literature previous finding is that clients do not believe that the provision of safety and health measures of construction site workers is their responsibility, also most clients often assume that it is the responsibility of the contractors' to comply with the relevant environmental, safety, and health regulations.

CONCLUSION AND RECOMMENDATION

It was revealed that a significant relationship exists between clients influence on safety and health measures. It can be concluded that the client's involvement significantly influence project safety performance. Despite the fact that the *r* value is low, there is room for improvement since the relationship

is positive. These improvements on the safety performance can be achieved based on the following recommendation.

1. Clients should consider using various evaluating measures of safety performance when selecting contractors, i.e., when setting performance objectives, monitoring safety performance, and participating in project safety programs. These measures include risk involved in the construction process, overall quality of safety program, management safety commitment, qualifications of project management team and safety personnel, worker participation, safety observation results, near misses, and etc.
2. Clients can help promote safety performance by implementing a carefully designed, dynamic safety program. These programs can serve as a viable model for others stakeholders to emulate.
3. A behavior or condition can be either safe, or unsafe. No unsafe behaviors or unsafe physical conditions should be ignored or tolerated. Referring to the results in the study, an improvement in the relationship between the clients influence in enhancing safety management and safety and health standard is attainable, particularly with the client's proactive involvement in safety. The clients' role in construction safety can be that of a party to oversee and facilitate safety management on the project. Clients may not always take the leadership role for project safety management, but the client's attitude towards safety and their physical involvement in safety will favorably impact the safety performance of general contractors and subcontractors.

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