Assessment of National Culture Dimensions and Construction Health and Safety Climate in Nigeria

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Abstract

Despite the increasing growth in the construction subsector in Nigeria, the institutional and regulatory framework for construction health and safety is highly fragmented and poorly implemented. The purpose of this paper was to explore the influence of national culture on the construction workers safety climate in South East Nigeria. The study employed the survey research method for the investigation. Structured questionnaires were administered to a sample of site operatives and management staff/personnel involved in construction projects in the study area. The responses were analyzed using the Product-Moment Correlation Coefficient ($r$) to determine the relationship between national culture dimensions and safety climate. A two-tailed $t$-test was also utilized to ascertain the significance of the relationship in the correlation observed. The study revealed that all five cultural dimensions except long term orientation highly and positively correlated with safety climate which invariably influences the safety perceptions and behaviour of construction workers. The correlation coefficients of the other four dimensions ranged from 0.75 to 0.99 while long term orientation dimension has correlation coefficients of 0.47 and 0.65 for operatives and managers respectively. In view of these revelations, there is urgent need for the provision of adequate and enforceable health and safety regulations for construction operations as well as the establishment of construction industry training institutes including trade centres in different parts of Nigeria. The study also advocates adequate consideration of workers cultural values and beliefs for a successful project implementation and delivery.


Introduction

Construction industry is the hub of social and economic development in all countries of the world. Though, the construction industry contributed only about 1.98% of the total Gross Domestic Product (GDP) to the Nigeria economy in 2009, its importance and roles in the development of the economy of any nation can never be disputed (National Bureau of Statistics, 2010) However, when compared with other labour intensive industries, construction industry has historically experienced a disproportionately high rate of disability injuries and fatalities for its size (Hinze, 1997). The industry alone produces 30% of all fatal industrial accidents across the European Union (EU), yet it employs only 10% of the working population (McKenzi; Gibb, and Bouchlaghem, 1999). In The United States of America (USA), the construction industry accounts for 22% of all fatal accidents (Che Hassan; Basha, and Hanafi 2007). In other countries such as Japan United Kingdom (UK) and Ireland, the situation is even not better. Bomel (2001) notes that in Japan, construction accidents account for 30%-40% of the overall industrial accidents, with the total being 50% in Ireland and 25% in the United Kingdom (UK). This situation is worse in the developing countries, particularly Nigeria where there are no reliable sources of data for such accident records. Currently, Nigeria is relatively experiencing a strong growth in construction activities. Unfortunately, anecdotal evidence shows that the enforcement of health and safety regulations is not a mainstream activity in Nigeria. Reacting to this state of affairs, Idoro (2007; 2008) argues that the framework of existing occupational and health conditions in Nigerian construction industry is grossly fragmented and inadequately enforced. Idoro (2008) therefore concludes that good health and safety conditions constitute good and safe business practice in construction. Generally, the integration of health and safety measures into the total quality management system within the construction sector could significantly contribute to cost efficiency, quality assurance, environmental sustainability, better employee-employer relation and satisfaction; Nevertheless, divergent perceptions, behaviours and actions exhibited by construction workers lead to serious accidents on site. This state of affairs has been linked to different cultural backgrounds. These cultural differences, according to authors (Ali, 2006; Che-Hassan et al., 2007; Ismail; Hashim, Ismail, and Majid 2009) have significant impacts on industrial safety climate. The authors further argue that adequate consideration of these differences help to understand different approaches to accident prevention and safety management. Ngowi and Mothibi (1996) found that cultural differences were the major reason for viewing safety procedures differently on construction sites in Botswana. Given the above scenario, the need for a proper investigation into the impact of national culture on the Nigerian construction safety climate is imperative.

1.2 Research Aim and Objectives

The primary aim of this study is to evaluate the influence of national culture on construction safety climate so as to provide a functional and effective safety climate for construction workers in Nigeria. In this regard, the specific objectives of the study include:

- To provide a better understanding of safety climate and factors that affect workers perceptions and attitudes towards safety on construction site;
2.0 Review

2.1 Safety Climate

Safety climate and safety culture are often used in a complementary manner. Although safety climate is not synonymous with safety culture, both have formed the nucleus of organizational climate and culture respectively (Okoye, 2010). For the past three decades or thereabout, safety climate and safety culture have received considerable attention in the safety literature. According to Mohd Saidin; Abdul, Yusof, Syamsus, and Mat (2008), the term safety culture was introduced during the nuclear safety debate of the International Nuclear Safety Advisory Group of the International Atomic Energy Agency (IAEA). The Advisory Committee for safety in Nuclear Installations (ACSNI) (1993), defines safety culture as the product of individual and group values, attitudes, perceptions, competence's and patterns of behavior that determine the commitment to safety and the life style and proficiency of an organization's health and safety management. The overall safety culture can be described as a set of beliefs, norms, attitudes and social technical practices that are concerned with minimizing the exposure of individuals within and beyond an organization, to conditions considered dangerous or injurious. Safety culture is seen according to Mohd Saidin et al. (2008), as a sub facet of organizational culture and exists at a higher level of abstraction than safety climate. But Cooper (2000) argues that it seems plausible that safety culture and safety climate are not reflective of a unitary concept, rather, they are complementary independent concepts.

2.2 Safety Climate Factors

Several researchers have identified different safety climate factors related to construction industry (Glendon and Litherland, 2001; Mohamed, 2002; and Yule; Flin, and Murdy 2007). However, in designing a framework for safety climate questionnaire, Fu; Zhang, Xi and Zhang (2006) review a number of safety climate surveys mainly from the year 2000 and found that nine (9) safety climate dimensions were most common. These include:

- Belief and value;
- Management commitment;
- Risk level and hazards identify;
- Management efficiency;
- Workers involvement and commitment;
- Safety institutes and specialists;
- Safety education and training;
- Site management; and
- Standardization.

When these nine (9) dimensions were analyzed and compared, the results show that management commitment and management efficiency occupy the first two (2) positions. Fu et al. (2006) however, suggest that researches involving detailed safety climate questionnaire could be based on the nine (9) outlined dimensions. The study, however, observes that safety climate factors can best be categorized into four (4) factors; namely:

- Management commitment;
- Workers involvement;
- Safety education and training; and
- Beliefs and perceptions.

These factors are therefore critical and relevant in the analyses and discussion of safety climate for construction workers in Nigeria.

2.3 Safety Management in the Construction Industry

In the modern business environment, occupational health and safety has become a very sensitive management aspect, which influences the very survival of organizations in some extreme cases (Bluuto; Griffith and Stephenson 2004). In view of this, the International Civil Aviation Organization (ICAO) (2005) advocates that organizations shift from traditional safety management approach, which is reactive to a modern approach that is more proactive. The emergence of new regulations, laws, standards and codes has also made many construction organizations to improve their safety performance. This is indirectly an indication that construction industry is showing interest in construction safety and health management. ICAO (2005) therefore, defines safety management system as an organized approach to managing safety, including the necessary organizational structures, accountabilities, policies, and procedures. It relates to actual practices, roles and functions associated with remaining safe (Ali, 2006). Also Mohd Saidin et al. (2008) emphasized that effective safety management is both functional (involving management control, monitoring, executive and communication sub-systems), and human (involving leadership, political and safety culture sub-systems paramount to safety culture).

2.4 National Culture and Construction Industry

Societies in which we live and grow up have their own sets of rules about the way we behave and interact with others. These rules or norms are not written down, and often, we are not even conscious of them. Such rules or norms which enable societies to act accordingly within their own environment are collectively called "culture" (Hope, 2004). An organization is a subset of the entity called society and each society has its own shared values and attitudes. Consequently, workers working within the organization constitute part of the organization. Thus, the workers, invariably exhibit the society's attitudes and behaviours as well. Therefore, organization's safety culture cannot be discussed without integral societal culture. In view of the foregoing, Peckitt; Glendon, and Booth (2002) contend that these societal forces that dictate the prevalent attitudes and behaviours relating to safety within a given culture are fundamental to the study of safety climate. According to Ang...
and Ofori (2001), culture possesses the following properties:

- It is social heritage or tradition;
- It is shared, learned human behavior; and
- It is symbolic and based on shared, assigned meaning of the members of a group.

However, Samovar; Poster and Jain (1981) see culture as the culmination of knowledge, experiences, beliefs, values, attitudes, meanings, hierarchies, religion, timing, roles, spatial relations, concepts of the universe and material objects and possessions acquired by a large group of people in the course of generation through individual and group striving. Mohd Saldin et al. (2008) argue that businesses are embedded within a given institutional and social setting; thus, making them susceptible to the influence of national culture. In the construction industry also, several researches have confirmed that the industry is being influenced by national culture; both at international and local levels (Akiner & Tijhuis, 2008; Ang & Ofori, 2001; Bredillet et al., 2009; Brochner; Josephson and Kadefors 2002; Chan & Tse, 2003; Kivrak; Ross and Arslan 2008; Lieshout & Steurenthaler, 2006; Mearns & Yule, 2009; Mohammed; White and Prabhakar 2008; Nummelin, & Sappala, 2005).

2.5 Dimensions of National Culture

To understand the influence of culture on societies, national culture needs to be classified into dimensions or categories (Hofstede, 1991; Aluko, 2003). Hofstede (1991, 2001) conducted one of the most influential studies on national and organizational culture based on the 1967 to 1973 studies at IBM (International Business Machines) worldwide and subsequent updates. Jones (2007) acknowledges that it is the most celebrated of its kind. The empirical analysis resulted in a concise framework of dimensions for differentiating national culture. Thus, five (5) cultural dimensions were identified by Hofstede (1991, 2001). These include:

- **Large vs. small power distance (PDI)**: The dimension of power distance has to do with the degree or extent to which unequal distribution of power is accepted or expected by members of organizations, institutions and societies;
- **Individualism vs. collectivism (IDV)**: Uncertainty avoidance (UAI) depicts the extent to which people react to or are threatened by uncertain or unknown situations.
- **Strong vs. weak uncertainty avoidance (UAI)**: This dimension deals with the extent to which people in an organization or society prefer to work in groups or alone. It indicates the degree of social/community integration (Jones, 2007).
- **Masculinity vs. femininity (MAS)**: Masculinity dimension (MAS) does not refer absolutely to the dominance of gender. Rather, it depicts the degree to which masculine traits like authority, assertiveness; performance and success are preferred to female characteristics such as personal relationships, quality of life service and welfare (Jones, 2007).
- **Long-term vs. short-term orientation (LTO)**: which is based on Chinese Confucian dynamism. Although there has been some strong criticisms on Hofstede's (1991, 2001) studies, the result of this work has remained influential (Jones, 2007, Mearns & Yule, 2009).

Other researchers have however, developed different frameworks for understanding culture, but in most cases, they have some similarities with Hofstede's dimensions. Some of the researchers who developed different but related cultural dimensions in this regard include; Hampden-Turner and Trompenaar (1993) and Global Leadership and Organizational Behaviour Effectiveness (GLOBE) project by House and Dorfman (2001). However, Peckitt et al. (2002) agree that both Hofstede (1991) and Hampden-Turner and Trompenaar (1993) studies differ in specific solutions they choose for problems. Peckitt et al. (2002) further maintain that though, there are many combinations, the correspondence between the two is not always perfect.

3.0 Research Methodology

The research was carried out in selected states of the South Eastern part of Nigeria. 180 questionnaires were distributed to construction workers (120 site operatives and 60 site management personnel) in 16 selected construction sites. The responses from the questionnaire survey and interviews were subjected to descriptive and quantitative analysis using simple bar charts, pie charts, tables, and percentages. Mean score Index and standard deviation were also used to evaluate the effects of safety climate factors on workers attitudes and perceptions as well as the influence of national culture dimensions on safety climate. Pearson Product-Moment Correlation Coefficient (r) was used to determine the nature of relationship between culture dimensions and workers safety climate. Correlation significance test was carried out with two-tailed non directional test statistic (t-test) at a given degree of freedom (n-2) and 5% (0.05) significance level. The analyses and results of the investigation are presented (Tables 1 to 2) and discussed in section 4.0.

4.0 Results and Discussion

<table>
<thead>
<tr>
<th>Cultural Dimension</th>
<th>Correlation Coeff. (r)</th>
<th>Nature of association</th>
<th>T - test value</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Distance</td>
<td>0.93</td>
<td>Very high +ve corr.</td>
<td>4·380</td>
<td>Reject H₀</td>
</tr>
<tr>
<td>Collectivism</td>
<td>0.88</td>
<td>High +ve corr.</td>
<td>3·209</td>
<td>Reject H₀</td>
</tr>
</tbody>
</table>

**Table 1:** Operatives Correlation between the cultural dimension and safety climate

Table 1 shows the results of the Pearson’s Correlation Coefficient (r) and t-test at p<0.05 on the influence of five cultural dimensions on the safety climate of construction site workers (operatives’ view). It is shown from the analysis that power distance dimension has a very high positive correction with safety climate with a Correlation Coefficient (r) of (0.93). When tested for correlation significance at (α = 0.05) significant level, the calculated t-test value (4.380) was greater than the critical value (3.182). This result therefore, led to rejection of the Null hypothesis (H₀); concluding that the relationship between power distance and safety climate is statistically significant at α = 0.05. Collectivism, femininity and uncertainty avoidance dimensions have 0.88, 0.95 and 0.75 respectively as their correlation coefficients. These three dimensions also showed high positive relationship with safety climate. But when tested for correlation significance, collectivism and femininity have their calculated t-values as 3.209 and 5.270 respectively which are greater than the critical value of 3.182. This equally showed that their association with safety climate was significant. The Null hypothesis (H₀) was also rejected at α = 0.05 significance level while the calculated t-test value for uncertainty avoidance was 1.964 which is lesser than the critical value (3.182). It was therefore concluded that the relationship between uncertainty avoidance and safety climate is not significant which led to the adoption of Null hypothesis (H₀). However, the correlation coefficient for long term orientation dimension was 0.47. This shows a weak positive correlation between long term orientation and safety climate. When the correlation was tested for significance, the t-value obtained was 0.922 which is lower than the critical t-value. This equally led to acceptance of the Null hypothesis (H₀) and the conclusion that there is no significant association between long term orientation culture and safety climate of workers at p<0.05. The next presentation in Table 2 shows the Managers correlation between cultural dimensions and safety climate.

### Table 2: Managers Correlation between the Cultural Dimensions and Safety Climate.

<table>
<thead>
<tr>
<th>Cultural Dimension</th>
<th>Safety Climate</th>
<th>Correlation Coeff. (r)</th>
<th>Nature of association</th>
<th>T - test val.</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Distance</td>
<td></td>
<td>0.91</td>
<td>Very high +ve corr.</td>
<td>3.802</td>
<td>Reject H₀</td>
</tr>
<tr>
<td>Collectivism</td>
<td></td>
<td>0.95</td>
<td>Very high +ve corr.</td>
<td>5.270</td>
<td>Reject H₀</td>
</tr>
<tr>
<td>Femininity</td>
<td></td>
<td>0.99</td>
<td>Very high +ve corr.</td>
<td>12.155</td>
<td>Reject H₀</td>
</tr>
<tr>
<td>Uncertainty Avoidance</td>
<td></td>
<td>0.9</td>
<td>Very high +ve corr.</td>
<td>3.576</td>
<td>Reject H₀</td>
</tr>
<tr>
<td>Long term orientation</td>
<td></td>
<td>0.65</td>
<td>Moderate +ve corr.</td>
<td>1.482</td>
<td>Reject H₀</td>
</tr>
</tbody>
</table>

Four the cultural dimension as observed from Table 2 power distance, collectivism, femininity and uncertainty avoidance have very high positive correlation with correlation coefficients (r) of 0.91, 0.95, 0.99 and 0.90 respectively with safety climate factors. when tested for significance of their association with safety climate using t-test statistic at α = 0.05 significance level, all the calculated t-test values obtained for the four dimensions were greater than the critical value of t-test at 0.05 significance level. The following values were obtained: Power distance = 3.802, collectivism = 5.270; femininity = 12.155; and uncertainty avoidance = 3.576. These values were greater than Critical, 0.05, 3 (3.182). As a result of this, the Null hypothesis (H₀) was rejected. The conclusion therefore was that the relationships between the four cultural factors and safety climate are significant at α = 0.05.

However, long term orientation culture factor had a moderate positive correlation with safety climate with correlation coefficient (r) of 0.65. When tested further for the significance of the relationship, the t-test value obtained (1.482) was less than t critical value (3.182) at 0.05 (5%) significance level. This however, supports the Null hypothesis and so justifies the acceptance of H₀. The conclusion was that the relationship between long term orientation culture and safety climate is not significant at (p< 0.05).

The results of Tables 1 and 2 show that culture influences the safety perceptions and attitudes (safety climate) of construction workers on site. The results also show a strong positive relationship in all the cultural dimensions except long term orientation where they show a weak positive and moderate positive relationships (0.47 and 0.65) respectively for operatives and mangers. This further shows that these culture dimensions have significant influence on workers’ safety perceptions and attitudes. However, this is not the case for long term orientation. The implications of these results are that:

- Large power distance, weak uncertainty avoidance, and short term orientation cultures promote unsafe behaviours, perceptions, and attitudes of construction workers towards safety on site.
Collectivism and femininity promote safe behaviours, perceptions and attitudes of construction workers towards safety on site.

5.0 Conclusion

The importance of safety on construction sites and safety of construction workers can never be over emphasized. This is because when accidents happen on site, they cause many human tragedies, de-motivate workers, disrupt site activities, delay project progress, and affect overall project cost, productivity and reputation of the firms concerned. Again, culture has been proved to influence all human activities, behaviours, perceptions, beliefs, attitudes and concepts. In view of this, research has tried to establish the links between culture, safety perceptions and attitudes of construction workers on site. Most importantly, the research has examined the cultural issues on workers and managers and identified the differences of opinions on national culture for workers and managers. Finally, this research has provided some useful insights into the safety national culture for workers and managers. The study therefore provides a better understanding of risk perceptions, attitudes and safe/unsafe behavior of construction workers; managers' safety practices, preferences and the extent to which workers' attitudes and perception interface with culture.

Recommendation

Based on the findings of this study, the following recommendations will be most useful:

- Adequate and enforceable health and safety regulations are urgently needed in the Nigerian construction industry for effective operations and practices. The rest of the 36 States and the Federal Government of Nigeria should borrow a leaf from South Africa and some European countries where such laws and regulations are effectively implemented. The Lagos State Government of Nigeria has taken a lead in this directed by enacting laws and regulations relating to health and safety for the protection of construction workers in the state;
- There is need for the establishment of Construction Industry Training Board (CITB) as well as the re-establishment of trade centres in Nigeria. These bodies should be charged with the task of training, retraining and providing advisory services to the Nigerian construction workforce;
- The Council of Registered Builders of Nigeria (CORBON), the Nigerian Institute of Building (NIoB) and other sister professional bodies should champion the establishment of these training institutes and centres across the nation since the control and management of workforce on site is in the hands of construction professionals;
- When working in any part of Nigeria, construction companies should consider and take into consideration the cultural values of their host community and that of their workers as these affect the project outcome.

References


