International Journal of Engineering and Medical Science Research

Vol. No.1, pp 11-24, March 2013

Published by European Centre for Research Training and Development UK (www.ea-journals.org)

APPRAISING THE INFLUENCE OF CULTURAL DETERMINANTS OF CONTRUCTION WORKERS SAFETY PERCEPTIONAND BEHAVIOUR IN NIGERIA

Okolie Kevin Chuks[1] and Okoye, Peter Uchenna[2]

1 Senior Lecturer Department of Building, Nnamdi Azikiwe University, Awka Nigeria
2 Lecturer, Department of Building, Nnamdi Azikiwe University, Awka Nigeria

Abstract: *Health and safety has been a source of concern to the performance of construction sector in Nigeria. The high rate of accidents and injuries occasioned by workers acts and perceptions attests to this concern. This paper assesses the cultural factors that influence the behaviour and perceptions of construction workers towards safety in South-East Nigeria. It provides a framework for incorporating cultural elements in issues relating to construction business. The study employed the survey research method for the investigation. Structured questionnaire was administered to a sample of site operatives and management staff involved in construction projects in the study area. Responses were analyzed using SPSS 16.0; mean score index and standard deviation to ascertain the influence of cultural elements on workers behaviour and perceptions. The study revealed that five cultural dimensions affect the way construction workers perceive and act towards safety. Respondents agreed that three dimensions (collectivism, uncertainty avoidance and long term orientation) promote safe behaviours and perceptions of workers, while power distance and masculinity promote unsafe behaviours and perceptions towards safety in construction. The study advocates adequate consideration of workers cultural values and beliefs in every construction business, especially those that promote safe behaviours and perceptions in the construction process.*

Keywords: Behaviour, Construction workers, Cultural Determinants, Nigeria, Safety Perception,

INTRODUCTION

Construction industry is unarguably the base for social and economic development in all countries of the world. Its position in economy of any nation cannot be compared. Though in the first quarter of 2012, the building and construction industry contributed 3.01% of the total Gross Domestic Product (GDP) to the Nigerian economy (National Bureau of Statistics 2012); its importance and roles in the development of economy of Nigeria and that of other nations can never be disputed.

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 (Mckenzie, Gibb, &

Bouchlaghem 1999). In The United States of America (USA), it accounts for 22% of all fatal accidents and only 7% of the employed (Che Hassan, Basha, & Wan Hanafi 2007). 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 even worse in the developing countries and Nigeria in particular, because there are no reliable sources of data for such accident records.

In developing countries, construction industry has performed far below the expectation in the areas of health and safety. The situation is quite pathetic in Nigeria because there is no existing functional legislation to that effect. Even the National Building Code which was approved by the National Executive Council since 2006 and the enforcement Bill currently before the National Assembly has not been passed into law till date. Based on these, Idoro (2007; 2008; 2011) argues that the framework of existing occupational and health conditions of Nigeria construction industry is grossly fragmented and inadequately enforced.

Commenting on the existing situation, Mohamed (1999) states that accidents on construction sites results to many human tragedies de-motivate workers, disrupt site activities, delay project progress, and adversely affect the overall cost, productivity and reputation of the construction industry. In recognition of the problems above, countries all over the world have seen the necessity of improving occupational health and safety management on construction sites, particularly, the reduction of the number of accidents on construction sites.

It has been established that unsafe behaviour is intrinsically linked to workplace accidents. It has also been confirmed that a positive correlation exists between workers safe behaviour and safety climate within construction site environment and that workers attitudes towards safety are influenced by their risk perceptions, risk management, safety rules and procedures and cultural background (Che Hassan *et al.* 2007; Fogarty & Shaw 2010; Glendon & Litherland 2001; Ho & Zeta 2004; Ismail, F., Hashim, Ismail, & Abdul Majid 2009; Mohamed 2002; Mohd Saidin, Abuld Hakim, Wan Yusoff, Syamsus & Mat 2008); Salminen & Seppala 2005).

Divergent perceptions, behaviours and actions exhibited by construction workers which have led to serious accidents on site have been linked to different cultural backgrounds. These cultural differences have some significant impact on industrial safety climate (Ali 2006; Che-Hassan *et al.* 2007; Ismail *et al.* 2009); and 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. Since safety is behaviour and modified by culture, it is imperative to investigate the cultural elements that promote safe/unsafe behaviour which in turn modifies the perception towards safety in the Nigerian construction industry.

Contributing to the high rate of accidents are those characteristics of the industry which distinguish it from the rest of other industries. These include:

- The high proportion of small firms and of self-employed workers;

- The variety and comparatively short life of construction sites;
- The high turnover of workers;
- The large numbers of seasonal and migrant workers, many of whom are unfamiliar with construction processes;
- Exposure to the weather; and
- Many different trades and occupations working at the same site.

Against this backdrop, this study seeks to evaluate the influence of cultural determinants on construction workers safety perceptions and behaviour in Nigeria in order to provide an effective framework for incorporating cultural elements in issues relating to construction business and safety of workers in Nigeria. This research is guided by the following hypotheses:

H_o: Culture dimensions do not significantly promote safe behaviours and perceptions of construction workers.

H_1: Culture dimensions do significantly promote safe behaviours and perceptions of construction workers.

LITERATURE REVIEW

Safety Climate (Safety Perception and Behaviour)

Safety climate is not synonymous with safety culture, but both have formed the nucleus of organizational climate and culture respectively (Okoye 2010). Over the years, safety climate and safety culture have received considerable attention in the safety literature. Occupational Safety and Health Council (OSHC) (2001) observes that one of the indicators of a positive safety culture is a good safety climate. Safety climate they say is often mistaken for safety culture as they are both inextricably linked, but are distinctly separate entities. However, safety climate refers to people's perceptions of, and attitudes towards safety (OSHC 2001); a manifestation of safety culture in the behaviour and expressed attitudes of employees (Cox & Flin 1998). 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. For Mohd Saidin *et al*. (2008), safety culture was seen as the sub facet of organizational culture and exists at a higher level of abstraction than safety climate. They further observe that 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, competences and patterns of behaviour 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. In view of this, Dingsdag, Sheahan, and Biggs (2006) advocate self regulation which is performance based regulation and behaviour dependent (safety culture), while Che Hassan *et al*. (2007) stress that developing a proactive safety culture may take long time and require spending of large sums of money for planning, investigating and implementing in each level within the organization and however, maintains that once it succeeds, the relative rewards will be achieved in terms of competitive advantage, quality reliability and profitability within the organization.

Furthermore, Håvold (2007) proposes safety orientation as a means of modeling safety behaviours and perception of workers. According to Havold (2005 cited in Havold 2007), safety orientation consists of the cultural and contextual factors that create the attitudes and behaviour which influence occupational health and safety. Organizations with a positive safety orientation are characterized by a perception of the importance of health and safety. They are also characterized by confidence in the efficacy of their chosen measures to create the necessary behaviour for avoiding or limiting accidents and to continuously improve health and safety.

Safety Climate Factors

Several researchers have identified different safety climate factors related to construction industry (Glendon & Litherland 2001; Mohamed 2002; and Yule, Flin, & Murdy 2007). However, in designing a framework for safety climate questionnaire, Fu, Zhang, Xie, and Zhang, (2006), reviewed a number of safety climate surveys mainly from 2000. 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, management commitment and management efficiency occupy the first two (2) positions respectively. Fu et al. (2006) however, suggest that researches involving detailed safety climate questionnaire could be done upon the nine (9) outlined dimensions. The implication is that there are communalities in the safety climate dimensions; industry and orientation notwithstanding. It is on this note that Okolie and Okoye (2012) observe 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.

Okolie and Okoye (2012) further maintain that these factors are critical and relevant in analyses and discussion of safety climate for construction workers in Nigeria. This paper however corroborates the position of Okolie and Okoye and therefore assesses the safety climate factors in the Nigerian construction industry.

Safety Management in the Construction Industry

In the modern business environment, occupational health and safety has become a very sensitive management responsibility and therefore influences the very survival of organizations in some extreme cases (Bhutto; Griffith & Stephenson 2004). In this regard, 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 increasing interest in construction health and safety 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).

Culture and Construction Industry

Societies have sets of rules about behaviours and interactions within the societies. These rules or norms are not written down, and often, people are not 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 an 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 said workers, invariably exhibit the society's attitudes and behaviours as well. Therefore, organization's safety culture cannot withstand without integral societal culture. Based on this, 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 behaviour; 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 Saidin 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, Yatim, & Ruiz 2010; Brochner, Josephson, & Kadefors 2002; Chan & Tse 2003; Kivrak, Ross, & Arslan 2008; Lieshout & Steurenthaler 2006; Mearns & Yule 2009; Mohammed, White, & Prabhakar 2008; Nummelin 2006; Salminen & Sappala 2005).

National Culture Dimensions

To understand the influence of culture on societies, national culture needs to be classified into dimensions (Hofstede 1991) or categories (Aluko 2003). Hofstede (1991, 2001) conducted one of the most influential studies on national and organizational culture based on work conducted between 1967 and 1973 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. Five (5) cultural dimensions were identified (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 an unequal distribution of power is accepted or expected by members of organizations, institutions and societies;
- **Individualism vs. Collectivism (IDV):** 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);
- **Strong vs. Weak Uncertainty Avoidance (UAI):** Uncertainty avoidance (UAI) depicts the extent to which people react to or are threatened by uncertain or unknown situations;
- **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 like personal relationships, quality of life service and welfare (Jones, 2007); and

- **Long-term vs. Short-term Orientation (LTO)**, which is based on Chinese Confucian dynamism.

Although, there has been some strong criticisms on Hofstede works (Jones 2007; Mearns & Yule 2009), the result of this work has remained influential. Other researchers have however, developed different frameworks for understanding culture, but in most cases, they have some similarities with Hofstede's dimensions. Other researchers who developed different but related cultural dimensions include; Hampden-Turner and Trompenaar (1993) and Global Leadership and Organizational Behaviour Effectiveness (GLOBE) project (House and Dorfman 2001). Notwithstanding, Peckitt et al. (2002) agree that both Hofstede (1991) and Hampden -Turner and Trompenaars' (1993) studies differ in specific solutions they choose for problems, but maintain that though, there are many combinations, the correspondence between the two is not always perfect.

METHODOLOGY

The research was carried out within the states in the South Eastern part of Nigeria. 350 questionnaires were distributed to construction workers (250 site operatives and 100 management personnel) in the 28 selected construction sites. Out of 350 questionnaires distributed, a total of 319 were returned completed and used for analysis. This represents 91.14% response rate which is very good for this kind of research. The data collected from questionnaire survey and interviews were subjected to descriptive and quantitative analyses using SPSS version 16.0. Mean score Index and standard deviations calculated were also used to assess the influence of national culture dimensions on workers safety perceptions and behaviours. A ONE – WAY ANOVA was also used to cast inference on the calculated mean scores and standard deviations to determine the extent of agreement between the two groups on the influence of national culture on workers safety perceptions and behaviours. In this case, the test statistic has an F sampling distribution with df1 and df2 degrees of freedom at a significant level (α) of 0.05 (5%). The analyses and results of the investigation are presented (Tables 1 to 5) and discussed in section 4.0.

RESULTS AND DISCUSSION

Table 1: Influence of power distance on safety perceptions and behaviour

Sources	Sum of squares	Degree of freedom	Mean squares	F-Ratio
Between	45.44	1	45.44	39.86
Within	362.46	317	1.14	
Total	407.90	318		Reject H_0

Source: Researchers field Survey, 2012.

Decision: Reject $\mathbf{H_0}$ since F_{stat} calculated (**39.86**) is greater than $F_{(1,317,\ 0.05)}$ tabulated (**3.87**) and conclude that there is significant difference between the agreements of operatives and managers on the influence of power distance on safety perceptions and behaviour of construction workers. The implication is that large power distance is responsible for unsafe behaviours workers exhibited while working on site

Table 2: Influence of collectivism on safety perceptions and behaviour

Sources	Sum of squares	Degree of freedom	Mean squares	F-Ratio
Between	0.28	1	0.28	0.193
Within	460.64	317	1.45	
Total	460.92	318		Accept H_0

Source: Researchers field Survey, 2012

Decision: Accept $\mathbf{H_0}$ since F_{stat} calculated (**0.193**) is less than $F_{(1,317,\ 0.05)}$ tabulated (**3.870**) and concludes that there is no significant difference between the agreements of operatives and managers on the influence of collectivism on construction workers safety perceptions and behaviours. This shows that both groups strongly believed that working as a team greatly influences how workers perceive and act towards the safety issues on construction site which makes them to see themselves as members of a family thereby promote safe behaviours.

Table 3: Influence of masculinity on safety perceptions and behaviour

Sources	Sum of squares	Degree of freedom	Mean squares	F-Ratio
Between	6.66	1	6.66	6.343
Within	333.07	317	1.05	
Total	339.73	318		Reject H_0

Source: Researchers field Survey, 2012

Decision: Reject $\mathbf{H_0}$ since F-statistic calculated (**6.343**) is greater than $F_{(1,\ 317,\ 0.05)}$ tabulated (**3.870**) and conclude that there is significant difference between the agreements of operatives and managers on the influence of masculinity on workers safety perceptions and behaviours. This stresses the importance of caring for one another (femininity) on construction site by the construction workers. The two groups (operatives and managers) could not agree also, in their

opinions because masculinity is associated with high power distance which they believed promote unsafe behaviour and does not guarantee total commitments and co-operation among workers.

Table 4: Influence of uncertainty avoidance on safety perceptions and behaviours

Sources	Sum of square	Degree of freedom	Mean squares	F-Ratio
Between	1.49	1	1.49	0.955
Within	493.90	317	1.56	Accept H_0
Total	217.67	318		

Source: Researchers Survey, 2012

Decision: Accept $\mathbf{H_0}$ since F_{stat} calculated (**0.955)** is less than $F_{(1, 139, 0.05)}$ tabulated (**3 .870**) and conclude that there is no significant difference between the agreements of operatives and managers on the influence of uncertainty avoidance on construction workers safety perceptions and behaviours. This shows that strong uncertainty avoidance promotes safe behaviours. Although construction workers as observed, take extra risks in order to make the ends meet, and are hardly induced by their inner desire to observe safety rules unless they are compelled to do so, they are too conscious of being injured on site due to family responsibilities

Table 5: Influence of long term orientation on safety perceptions and behaviours

Sources	Sum of squares	Degree of freedom	Mean squares	F-Ratio
Between	2.83	1	2.83	1.862
Within	482.50	317	1.52	
Total	485.33	318		Accept H_0

Source: Researchers field Survey, 2012

Decision: Accept H_0 since F_{stat} calculated (**1.862**) is less than $F_{(1, 317, \text{and } 0.05)}$ tabulated (**3.870**) and conclude that there is no significant difference between the agreements of operatives and managers on the influence of long term orientation on construction workers safety perceptions and behaviours. The implication is that short term orientation promotes unsafe behaviour and that the future of workers is not always guaranteed and so workers seek alternative means without considering the safety consequences. Generally, it is evident from the results of the analyses above that there are concordant views that culture embedded in national culture dimensions greatly influences the ways construction workers perceive and act towards safety issues in Nigeria. Some of these are situational while others are in-born.

The results of this study have some practical and theoretical implications as follows:

- **Collectivism, strong uncertainty avoidance, and long term orientation cultures promote safe behaviours, perceptions and attitudes of construction workers towards safety on site; and**
- **Large power distance and masculinity cultures promote unsafe behaviours, perceptions, and attitudes of construction workers towards safety on site.**

CONCLUSION AND RECOMMENDATION

Safety is fundamental to human existence, its importance in every construction operation and worker is unparalleled. This is because safety is a behaviour which can be learned or in-born. Likewise, culture has been proved to have influence on all human activities, including behaviours, perceptions, beliefs, attitudes and concepts. This study has therefore established that culture greatly influence construction workers safety perceptions and behaviours in Nigeria. It has revealed the cultural elements that promote and/or hinder safe behaviours and perceptions of Nigerian construction workers. The study has provided a better understanding of risk perceptions, attitudes and safe/unsafe behaviours of construction workers; managers' safety practices, preferences and the extent to which workers' attitudes and perception interface with culture. It is recommended that construction firms consider the cultural values of their host community and that of their workers while carrying out their construction businesses in Nigeria as these affect the project outcome. The results of this study implies that *Collectivism, strong uncertainty avoidance and long term orientation cultures* should be adopted by construction organizations as appropriate tools for the effective implementation of construction workers safety practices on site. Furthermore, there is need to conduct more research into the relationship between culture, safety, human behaviour and perception of construction workers. This may reveal more frameworks of dimensions for differentiating national culture as there seem to be opportunities for such explorations beyond this study.

References

Advisory Committee on the Safety of Nuclear Installations (ACSNI). (1993). *Third Report of the Human Factors Safety Group of the Advisory Committee on safety in the Nuclear Industry*. Health and Safety Commission, HMSO, London.

Akiner, I. and Tijhuis, W. (2008). Cultural Variables and the Link between Managerial Characteristics in Construction Industry: Reflections from Turkish and Dutch Examples. *International Conference on Multi-National Construction Projects, Securing High Performance through Cultural Awareness and Dispute Avoidance,* Shanghai, China.

Ali, T. H. (2006*). Influence of National Culture on Construction Safety Climate in Pakistan.* Unpublished PhD Thesis, Faculty of Engineering and Information Technology, Griffith University, Gold Coast.

Aluko, M.A.O. (2003). The Impact of Culture on Organizational Performance in Selected Textile Firms in Nigeria. *Nordic Journal of African Students*, 12 (2), *pp. 164-179*.

Ang, Y.K. and Ofori, G. (2001). Chinese Culture and Successful Implementation of Partnering in Singapore's Construction Industry. *Construction Management and Economics*, 19, pp. 619-632. http://www.tandf.co.uk/journals. Accessed January 30, 2012.

Bhutto, K., Griffith, A., and Stephenson, P. (2004). Evaluation of Quality, Health and Safety and Environmental Management Systems and their Implementation in Contracting Organizations. *Proceedings of the International Construction Research Conference of the Royal Institute of Chartered Surveyors (COBRA)*, Leeds Metropolitan University Leeds.

Bomel Ltd (2001). Improving Health and Safety in Construction Phase 1: Data Collection, Review and Structuring. *Contract Research Report 386/2001*. HSE Books, Sudbury.

Bredillet, C., Yatim, F. and Ruiz, P. (2010). Project Management Deployment: The Role of Cultural Factors. *International Journal of Project Management*, 28, pp. 183-193. Www. sciencedirect.com Accessed February 14, 2012.

Brochner, J., Josephson, P.E. and Kadefors, A. (2002). Swedish Construction Culture, Quality Management and Collaborative Practice. *Building Research and Information*, 30 (6), pp. 392 – 400. http:// www.tandf.co.uk/jouranls.

Che Hassan, C.R., Basha, O.J. and Wan Hanafi, W.H. (2007). Perception of Building Construction Workers towards Safety, Health and Environment. *Journal of Engineering Science and technology*, 2 (3), 271 -279.

Chan, E.W. and Tse, R.Y.C. (2003). Cultural Considerations in International Construction Contacts. *Journal of Construction Engineering and Management (ASCE)*, 129 (4), pp. 375-381.

Cooper, M.D. (2000). Towards a Model of Safety Culture. *Safety Science*, 36,

Cox, S. and Flin, R. (1998). Safety Climate: Philosopher's Stone or Man of Straw? *Work and Stress*, 121, pp. 189-201.

Coyle, I., Saleman, S. D. and Adams, N. (1995). Safety Climate. *Journal of Safety Research*, 26, pp. 247-254.

Dingsdag, D. P., Sheahan, V. L., and Biggs, H. C. (2006). Safety Culture in the Construction Industry: Changing Behaviour through Enforcement and Education? In *Proceedings Clients Driving Innovation: Moving Ideas into Practice. The Second International Conference of the CRC for Construction Innovation*. Accessed from: https://eprints.qut.edu.au Accessed February 14, 2012.

Flin, R. Conner, P.O and Bryden, R. (2000). Measuring Safety Climate: Identifying the Common Features. *Safety Science*, 34 (1-3) pp. 177-192

Fu, G., Zhang, J., Xie, X. and Zhang, Z. (2006). Design for Safety Climate Questionnaire Framework. *National Science Foundation of China*.

Glendon, A.I. and Litherland, D.K. (2001). Safety Climate Factors, Group Differences and Safety Behaviour in Road Construction. *Safety Science*, 39 (3), pp. 157-188.

Hampden-Turner, C. and Trompenaar, F. (1993). *The Seven Cultures of Capitalism.* Doubleday. Cambridge University Press, Cambridge.

Håvold, J. I. (2007). From Safety Culture to Safety

Orientation: *Developing a Tool to Measure Safety in Shipping* Thesis for the Degree of Doktor Ingeniør Norwegian University of Science and Technology, Faculty of Social Sciences and Technology Management, Department of Industrial Economics and Technology Management

Hinze, J. W. (1997*). Construction Safety*. Prentice Hall Publications, New Jersey.

Ho, J.K.L. and Zeta, K.C. (2004). Cultural Factors and their Significance to the Hong Kong Construction Industry. *Safety Science*, 39, pp. 157-188.

Hofstede, G. (1991). *Cultures and Organizations: Software of the Mind*. McGraw Hill, London.

Hofstede, G. (2001). *Cultures Consequences: Comparing Values, Behaviors, Institutions, and Organizations, Across Nations*. (2nd edition). Sage Publications, London.

Hope, C. A. (2004). The Impact of National culture on Transfer of Best Practice Operations Management in Hotels in St. Lucia. *Tourism Management*, 25, pp. 45-59.

House, J. and Dorfman, M. (2001). Project GLOBE: An Introduction. *Applied Psychology: An International Review*, 50 (4), pp. 489 – 505.

Idoro, G. I. (2007). Contractors Characteristics and Health and Safety Performance in the Nigerian construction Industry. *In proceedings of CIB World Building Conference on constructing for Development*, Cape Town, South Africa.

Idoro, G. I. (2008). Health and Safety Management Efforts as Correlates of Performance in the Nigeria construction Industry. *Journal of Civil Engineering and Management*, 14 (4), pp. 277-285. Http; // www.jcem.uglu.it Accessed march 17, 2012.

Idoro, G. I. (2011).Comparing Occupational Health and Safety (OHS) Management Efforts and Performance of Nigerian Construction Contractors. *Journal of Construction in Developing Countries. Preview Manuscript.*

Ismail, F., Hashim, A. E., Ismail, R. and Abdul Majid, M.Z. (2009). Operationalization of Safety Culture for the Malaysian Construction Organizations. *International Journal of Business and Management*, 4(9), pp. 226-237. Www. Ccsenet.orgl.journal.html. accessed March 17, 2012.

Jones, M. L. (2007). Hofstede - Culturally Questionable? Faculty of Commerce- Papers. *Oxford Business & Economics Conference*, Oxford. UK. http:// ro.uow.edu.au/commpapers/370. Accessed March 17, 2012

Kivrak, S., Ross, A. and Arslan, G. (2008). Effects of Cultural Differences in Construction Projects: An Investigation Among UK Construction Professional. *International Conference on Multi-National Construction Projects, Securing High Performance through Cultural Awareness and Dispute Avoidanc*e, Shanghai, China.

Lieshout, S. V. and Steurenthaler, J. (2006). *Effective Multi-cultural project Management: Bridging the Gap Between national Cultures and Conflict Management Styles*. Unpublished Final Thesis for Degree of Bachelor of Science in Business Administration, University of Gavle, Sweden. http:// www.hig.se. Accessed March 17, 2012

Mckenzie, J. Gibb, A.G.F. and Bouchlaghem N.M. (1999). Communication of Health and Safety in Design Phase. Implementation of Safety and Health on Construction Sites.

Proceedings of the 2nd International Conference of International Council for Research and Innovation in Building and Construction (CIB) Working Commission w99. Honolulu. Pp. 419-426.

Mearns, K. and Yule, S. (2009). The Role of National Culture in Determining Safety Performance Challenges for the Global Oil and Gas Industry. *Safety Science,* 47, pp. 777-785. www.sciencedirect.com. Accessed January 30, 2012.

Mohamed, S. (2002). Safety Climate in Construction Site Environments. *ASCE Journal of Construction Engineering and Management,* 128 (5), pp. 375-383.

Mohammed, U.K., White, G.R.T. and Prabhakar, G.P, (2008). Culture and Conflict Management Style of International Project Managers. *International Journal of Business and Management* 3 (5).

Mohd Saidin, M., Abuld Hakim, M., Wan Yusoff, W.M., Syamsus, H. M. and Mat, N. A. (2008). Development of Safety Culture in the Construction Industry: The Leadership and Training Roles. *2nd International Conference on Built Environment in Developing Countries (ICBEDC),* pp. 1902-1920.

National Bureau of Statistics. (2012). GDP Report for Q1, 2012. *Building & Construction*. www.nigeriastat.gov.ng. Accessed June 2, 2012

Ngowi, A. B. and Mothibi, J. (1996). Culture and Safety at Work Site- A case Study at Botswana. In L. M. Alvez Dias and R.J. Coble (Eds). *Implementation of Safety and Health on Construction Sites, CIB W99 1996* Lisbon. Balkema, Rotterdam, pp. 417-429.

Nummelin. M. J. (2006). Measuring Organizational Cultural in Construction Sector-Finish Sample. *CCIM; conference*.www.crgp.stamford.edu/publications/conference papers. Accessed February 24, 2012

Peckitt, S. J., Glendon, A. J. and Booth, I. T. (2002). A Comparative Study of Safety Culture in Construction Industry of Britain and the Caribbean. *Proceedings of the International Symposium of the Working Commission CIB W92, Procurement Systems and Technology Transfer. The Engineering Institute, University of West Indies, Trinidad & Tobago*. Pp. 195 – 214.

Occupational Safety and Health Council (OSHC), (2001). A Survey of Safety Culture in Hong Kong Construction Industry. Available from: www.bre.polyu.edu.hk. Accessed March 17, 2012.

Okolie, K. C. and Okoye, P. U. (2012). Assessment of National Culture Dimensions and Construction Health and Safety Climate in Nigeria, Science Journal of Environmental Engineering Research, Volume 2012, Article ID sjeer-167.

Okoye, P. U, (2010). The Influence of National Culture on Workers Safety Climate in the Nigerian Construction Industry. Unpublished M.Sc Thesis, Department of Building, Faculty of Environmental Sciences, Nnamdi Azikiwe University, Awka.

Sadullah, O. and Kanten, S. (2009). A Research on the Effect of Organizational Safety Climate upon the Safe Behaviours. *Ege Akademik Bakis/Ege Academic Review*, 9 (3) 923 – 923.

Salminen, S. and Seppala, A. (2005). Safety Climate in Finish – and Swedish-Speaking Companies. *International Journal of Occupational Safety and Ergonomics (JOSE)*, 11 (4), pp. 389-397.

Samovar, L. A., Poster, R. E. and Jain, N. C. (1981). *Understanding Intercultural Communication.* Wadsworth. Belmont, C. A.

Yule, S. Flin, R. and Murdy, A. (2007). The Role of Management and Safety Climate in Preventing Risk Taking at Work. *International Journal of Risk Assessment and Management*, 7 (2), pp. 137-151.

E-mail: kc.okolie@unizik.edu.ng; quatity4pee@yahoo.com.