ASSESSMENT OF THE IMPLEMENTATION OF OCCUPATIONAL SAFETY REGULATIONS IN BLOCK INDUSTRIES IN MINNA METROPOLIS

BY

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2016/1/63827TI

DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION,
FEDERAL UNIVERSITY OF TECHNOLOGY
MINNA

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A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION FEDERAL UNIVERSITY OF TECHNOOGY, MINNA IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF BACHELOR OF TECHNOLOGY DEGREE (B. TECH) IN INDUSTRIAL AND TECHNOLOGY EDUCATION

APRIL, 2023

DECLARATION

I OKOYE, Joseph Chigozie, Matric No: 2016/1/63827TI, an undergraduate student of the Department of Industrial and Technology Education certify that the work embodied in this project is original and has not been submitted in part or full for any other diploma or degree of this or any other university.

_____ _____

OKOYE, Joseph Chigozie **Signature & Date**
2016/1/63827TI

CERTIFICATION

This project has been read and approved as meeting the requirements for the award of B. Tech degree in Industrial and Technology Education, School of Science and Technology Education, Federal University of Technology, Minna.

_____	_____
Mr. ABUTU FRANCIS Project Supervisor	Sign & Date
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Dr. T. M. Saba Head of Department	Sign & Date
_____	_____
External Examiner	Sign & Date

DEDICATION

The researcher hereby dedicates this research project work to his family, for their support and prayers.

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ABSTRACT

This study assessed the level of implementation of occupational health and safety regulations in block industries in Minna metropolis, Niger state. The study specifically ascertained the level of implementation of occupational health and safety regulations in blocks industries; determined challenges to effective implementation of occupational health and safety regulations in block industries and also determined ways of improving the implementation of occupational health and safety regulations in block industries in Minna , Niger State, Nigeria. The study adopted survey research design in which data was collected through a 39 item questionnaire on a population of 142 literate respondents. The questionnaire was validated by three university lecturers, pilot tested in Kaduna state and reliability coefficient calculated and found to be 0.87 using Cronbach Alpha reliability statistics. Data collected was analyzed using mean, standard deviation and z-test statistics. Mean and standard deviation were used to answer the research questions while the z-test statistics was used to test the null hypotheses at 0.05 level of significance. Findings of the study revealed among others that several occupational health and safety regulations stipulated in the factory act for block industries are not being implemented in Niger State block industries, that the challenges to effective implementation of occupational health and safety regulations in block industries in Niger State among others include: excess cost reduction tendency among owners of block industries, inadequate safety facilities in brick and block industries as well as high cost of training and retraining of workers on Occupational Health and Safety (OHS) practices. Findings of the study further revealed that the ways of improving implementation of occupational health and safety regulations in Minna , Niger State block industries among others include: provision of adequate OHS facilities in block industries, regular training and retraining of workers on OHS regulation implementation and practices as well as developing more stricter Nigeria based OHS regulations plus policy plans in block industries.. The study recommended among others: that the Niger State government, the Niger State ministry of labour and productivity as well as other industrial stakeholders should intensify effort toward investment and policy reforms to ensure stricter implementation of occupational health and safety regulations in block industries in Minna, Niger State, Nigeria.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Study

In most standard small, medium and large scale manufacturing industries in recent times safety is first. This is due to the importance of safety and safety practices in ensuring good health, smooth and uninterrupted production activities and regular profit for industries. Safety is the state of been safe, sound, in good condition and protected from dangers. Godbey (1999) described industrial safety as the science which investigates the facts by logic and knowledge to ensure that personnel and equipment operate harmoniously in a defined environment which will not encounter unexpected or inadvertent events that would result in injury or damage to either of them. While safety regulations describes the basic rules or guide lines to follow or adhere to in other to ensure safety of materials, equipment, machines and personnel in the work place (Atsumbe, Ohize, Abutu & Amine,2013).

Jain (2010) attributed the high rate of accidents in industries to poor attitude of workers towards safety practices, poor attitudes of employers towards provision of safety awareness training courses and incomplete instructions on safe practices and technical know-how on the operation of tools, equipment and machineries. Also workers operate machines without a guard, drop objects on their toes, or cut their hands because of misuse of tools. These poor work practices among others are the issues the promulgated 1990 Factory Act of Nigeria seeks to address.

The Federal Republic of Nigeria (1990) in her Factory Act revealed that strict adherence to these safety regulations helps to reduce industrial accident and promote good occupational

health. Mwombeki (2005) defined industrial accidents as an unplanned and unexpected occurrence which upsets a planned sequence of work; resulting to loss of production, injury to personnel, damage to plant and equipment and eventually interrupting production flow. When industrial accidents occurs in block industries they disrupt smooth operational activities and may also have negative risky effect on the workers occupational health. Eilbert (1996) described occupational health as the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations. In practice, sustaining and maintaining the physical, mental and social well-being of workers in block industries is paramount as it enhances smooth operations and quick attainment of company objectives.

In line with the objectives of block industry, block industry can operationally be define as the industry saddled with the responsibility to make block needed for various forms of building construction works for both domestic and industrial process. According to the Federal Republic of Nigeria (FRN)(2013) in her national policy on education, blocklaying work forms a major component of the building trades in technical colleges. According to Donald (2011), the goals or objectives of block industries in Nigeria basically involves production of varieties of bricks and block products needed in the society for building construction works. Their goals also extend towards providing training opportunities to trainees from technical and technological institutions seeking industrial training opportunities to acquire skills for block making.

To achieve the goals of block industries, its workers need to be informed on the relevance of safety to their life and career. Safety in the brick and block industries is very vital to ensure quality block products as it ensure that the workers are fit, active and enhance smooth production activities. Good safety practices helps to improve occupational health of workers

and reduce the hazards associated with poor health practices. Recently occupational health, and safety has formed a twin word called “occupational safety and health”. This is a new domain which forms the basic focus of most safety and health agency in every country of the world such as the United States Occupational Safety and Health Administration (OSHA) and the factories Act 1990 which is a law regulating safety, health and welfare of workers in factories in Nigeria. Benjamin (2008) generally defined Occupational safety and health (OSH) as the science of the anticipation, recognition, evaluation and control of hazards arising in or from the workplace that could impair the health and well-being of workers, taking into account the possible impact on the surrounding communities and the general environment.

Safety domain is necessarily vast, encompassing a large number of disciplines and numerous workplace and environmental hazards. A wide range of structures, skills, knowledge and analytical capacities are needed to coordinate and implement national OSH systems so that protection is extended to both workers and the environment. The protection of workers against sickness, disease and injury related to the working environment, has been a central issue for the International Labour Organization (ILO) since its creation in 1919, and continues to be so today. This is because occupational safety and health is a key element in achieving sustained decent working conditions and strong preventive safety cultures. However,Ogunsanmi, Salako, ,and Ajayi (2011) revealed that the workers in the block industries in Nigeria appear not to be fully aware of the responsibility of their employers as regard safety provision, healthcare and welfare. Also the industries in Nigeria have not fully implemented the appropriate occupational health and safety regulations needed to be provided by employers for the benefit of employees and the company at large.

The failure by employers to provide safe and conducive work environment, or the inability to use these facilities appropriately by employees, has cost implications on individuals, organizations, and the society. The adoption of a health and safety management system (HSMS) demonstrates in practical terms, the readiness of an organization to minimize the frequency and severity of work related accidents, ill health, and damage to property to ensure existence of functional health and safety laws. Health and safety laws ensure that organizations safe guide the health, safety and welfare of workers and visitors by protecting them from risks emanating from their work activities, and that employees use facilities and re- sources provided by their employers in a manner that will neither lead to property damage nor put them or others at risk. Based on the International Labour Organization (ILO,2010) report, typical examples of health and safety Acts and regulations include: The Nigerian Factory Act of 1990 (Nigerian adaptation of United Kingdom, UK Factory Act of 1961), the Occupation Safety and Health Act of 1970 (United State of America, USA), the Control of Substance Hazardous to Health Regulations of 1988 (UK), the Personal Protective Equipment at Work Regulations of 1992 (UK), the Management of Health and Safety at Work Regulations of 1999 (UK), The Manual Handling Operations Regulations of 1992 (UK), the Construction Design and Management Regulations of 2007 (UK).

The Factory Act was enacted in 1961 in Britain and subsequently adopted in Nigeria in 1990. The content of the Nigerian Factory Act of 1990 sets out to make provisions that will safeguard the safety and health of the workers in any organization that employs people under the Nigerian labour law. With this development, the Nigeria Industrial Standard came into being. It is intended to provide guidelines with respect to the following: general safety and health of workers; welfare of workers which entails anything to be done to improve the

comfort of workers; and provision of safety tools and materials for effective and safe operations at work. According to the factory act, safety tools and materials include the following: safety helmet; hand gloves; safety boots; protective clothing (apron, overall etc.); face protector; ear protector and respirator. The act stated that in the block industries in Nigeria management and workers should be ready to obey all acts and regulations relating to safety of persons and equipment. National Institute for Occupational Safety and Health (NIOSH) (2010) revealed that effective implementation of the occupational health and safety rules as contained in the Nigerian Factory Act of 1990 involves the following group of people: inspectors; safety officers; safety representatives; users of the facility. The health and safety Acts and regulations also stipulates the nature of punishments for non-compliance.

In spite of these statutory provisions and expectations, there is still a gap in health and safety management in block making industries in Nigeria. This gap is largely due to a dysfunctional health and safety law, causing an apparent lack of regulation of health and safety in almost every sector of the economy. Employers and contractors in Nigeria's block industry as well as other building construction firms are left to use their discretion in managing health and safety issues. The dangers associated with poor awareness and implementation of occupational health and safety regulations in block industries in Nigeria are numerous. Consequently, employers and contractors in trying to maximize profit, allocate little resources to health and safety management, rarely keep, report, or release accurate records of accidents and injuries occurring at their work sites (Idoro,2004).

Richard and Faye (2000) further reported that other consequences of lack of observant, poor awareness and poor implementation of OHS acts is the outbreak of occupational diseases and illnesses prevailing among workers in block industries in Nigeria. These diseases and

illnesses according to Richard and Faye have numerous adverse effects on human health such as respiratory effects, chronic cough, dermatologic effects, reproductive effects, repeated trauma disorder, musculoskeletal disorders, cancer, injuries resulting from cataract/poor sight, skin diseases and disorders. Skin diseases or disorders peculiar to the block industries include contact dermatitis, urticaria, sunburn, skin cancer, eczema or rash caused by primary irritations and sensitizers.

In view of the above, Idoro (2008) noted that the inadequate implementation of health and safety rules and regulations as a result of poor attitude of management staff of block industries to the provision of the factory law, leads to frequent sudden occurrence of industrial accidents, injuries, occupational diseases, ill health and dearth of accurate records on health and safety performance. The non compliance to the law makes it difficult to have meaningful improvement in health and safety standards in the block industry in Nigeria. Idoro further lamented that owners and managers of block industries in Nigeria as well as several building construction industries appears seemingly not duty bound to establish management systems that could improve safety awareness and implement appropriate standards. The question now boils down to the level of implementation of the occupational health and safety practices in the block industry as demanded by the provisions of the factory act of Nigeria. The researcher therefore decided to carry out and assessment of the level of implementation of occupational safety regulations in block industries in Minna metropolis..

1.2 Statement of the Problem

Meeting the dynamic design requirements for block in modern building increases the work load on the workers and as a result exposes workers to more occupational hazards that threatens human health. The problematic situation of block industry in Niger State is that

their operations are mostly manual and under stressful working conditions. Ogunsanmi, Salako and Ajayi (2011) revealed that the potential hazards for workers manually in block manufacturing includes: eye, skin and respiratory tract irritation from exposure to cement dust, wet concrete; inadequate safety guards on equipment and machines; over exertion and awkward postures; slips, trips and falling objects; and chemical burns from wet concrete.

Ogunsanmi, Salako and Ajayi also reported that exposure to cement dust can irritate eyes, nose, throat and the upper respiratory system. Skin contact may result in moderate irritation to thickening/cracking of skin to severe skin damage from chemical burns. Silica exposure can lead to lung injuries including silicosis and lung cancer. Exposure to wet concrete can result in skin irritation or even first-, second- or third-degree chemical burns. Compounds such as hexavalent chromium may also be harmful. Unguarded machinery used in the manufacturing process can lead to worker injuries. Workers working manually and without safety clothing may be hit by falling objects from raised heights, elevators or concrete block stacking equipment. Improper lifting, awkward postures and repetitive motions can lead to sprains, strains and other musculoskeletal disorders. Mixers and ready-mix trucks have confined spaces that pose safety risks for workers. These hazards have negatively affected the workers health and safety in most bricks and block making industries in Niger State and have created temporary and permanent impairment among workers (Akanya ,2008)

It appears as if the level of implementation of occupational health and safety regulations in brick and block industries in Minna metropolis is not up to expectation because according to Osrisakwe (2007), the increasing rate of fatalities due to non adherence to occupational health and safety regulations in Niger state block industries is a clear indication that workers are not fully aware of the potential dangers associated with occupational diseases, illnesses

associated with poor health practices and negligence to safety practices in their places of work. Observation by the researcher showed that alot of workers in the block industries in Niger State work for survival without paying attention to the occupational health hazard and safety practices surrounding their work places. The Minna block industry workers are also ignorant of the responsibilities and obligation of the industry in terms of health care provision for workers as well as the safety training needs of workers. If nothing is done to improve the current practice a lot of workers in Niger State block industry are likely to suffer more health problems which will consequently disrupt smooth operational activities and reduce production capacity in the brick and block industries. It is the poor occupational health and safety practices prevalent in the block industries in Minna metropolis that gave birth to this study. The question now is what is the level of implementation of occupational safety regulations in block industries in Minna metropolis ?

1.3 Purpose of the Study

The, major purpose of the study is to investigate the level of implementation of occupational safety regulations in block industries in Minna metropolis. The specific objectives of the study were to:

1. Ascertain the level of implementation of occupational health and safety regulations in block industries.
2. Determine challenges to effective implementation of occupational health and safety regulations in block industries.
3. Determine ways of improving the implementation of occupational health and safety regulations in block industries.

1.4 Significance of the Study

The findings of the study shall be of immense benefit to workers in brick and block industries, building trade students, technical teachers, brick and block industry, curriculum planners, Government and the society at large. The findings of the study will expose workers to the occupational health and safety regulations in brick and block industries. It will expose workers to the hazards associated with poor implementation of occupational health and safety regulations in the brick and block making industries. The findings of the study when made available to building trade students and graduates will expose them to the requisite occupational health and safety regulations needed by building trade students and graduates for effective performance in the brick and block industry. The findings of this study will help the technical teachers in stressing the needed occupational health and safety regulations during the instructional process to reduce industrial accidents associated with poor awareness and implementation of occupational health and safety regulations in the brick and block industries.

To workers in the brick and block industry, adequate awareness and implementation of occupational health and safety regulations will greatly reduce workplace accidents and financial expenses on accident victims, thereby helping in making workers more physically and mentally fit to carry out their duties. The knowledge from the findings of this study will help curriculum planners during curriculum review to ensure a workable and appropriate curriculum in building trade. The findings of the study will also benefit the government and the society at large as it will create a more conducive work environment for brick and block making thereby attracting investors to the trade to enhance economic growth and development.

1.5 Scope of the Study

The study covers block making industries randomly selected from Minna metropolis. The study focuses on carrying out an investigation to determine the level of awareness and implementation of occupational health and safety regulations in block industries in Minna metropolis. It also determined challenges to effective implementation of occupational health and safety regulations, and also to determined ways of improving implementation of occupational health and safety regulations in block industries.

1.6 Research Questions

The following research questions were raised and guided the study:

1. What is the level of implementation of occupational health and safety regulations in block industries?
2. What are the challenges to effective implementation of occupational health and safety regulations in block industries?
3. What are the ways of improving implementation of occupational health and safety regulations in block industries?

1.7 Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significances.

HO_1: There is no significant difference in the mean responses of management and non management staff of block industry on the level of implementation of occupational health and safety regulations in block industries.

HO_2: There is no significant difference in the mean responses of management and non management staff of block industry on the challenges to effective implementation of occupational health and safety regulations in block industries.

HO_3 : There is no significant difference in the mean responses of management and non management staff of block industry on the ways of improving implementation of occupational health and safety regulations in block industries.

CHAPTER TWO

2.0 LITERATURE REVIEW

The literature related to this study was reviewed under the underlisted subheadings:

2.1 Conceptual Framework of the Study

2.1.1 Occupational safety and health regulation awareness in block industries

2.1.2 Implementation of Occupational safety and health regulation in block industries

2.1.3 Occupational health and safety regulations in block industries

2.1.4 Block Making Processes and Procedures

2.1.5 Occupational Health Hazards, Occupational Safety and Health Management

2.1.6 Benefits of promoting adherence to Occupational Health and Safety Regulations (OHSR) in Block industries.

2.1.7 Ways of improving OHSR awareness and implementation in Block industries.

2.2 Theoretical Framework of the Study

2.3 Related Empirical Studies

2.4 Summary of Literature Reviewed

2.1.1 Occupational safety and health regulation awareness in block industries

Occupational safety and health (OSH) is generally defined as the science of the anticipation, recognition, evaluation and control of hazards arising in or from the workplace that could impair the health and well-being of workers, taking into account the possible impact on the surrounding communities and the general environment (Benjamin, 2008). OSH is an interdisciplinary area that involves protecting the health, safety and welfare of people in the workplace (Kalejaiye 2013) and others that may be affected directly or indirectly by the activities at the workplace. There are sets of rules, regulations, legal instruments or provisions that help in actualizing healthy working condition and safe work environment. For the purpose of this study, they are called OSH regulations. This domain is necessarily vast, encompassing a large number of disciplines and numerous workplace and environmental hazards. A wide range of structures, skills, knowledge and analytical capacities are needed to coordinate and implement all aspects that make up national OSH systems so that protection is extended to both workers and the environment. Benjamin (2008) revealed that the scope of occupational safety and health has evolved gradually and continuously in response to social, political, technological and economic changes. In recent years, globalization of the world's economies and its repercussions have been perceived as the greatest force for change in the world of work, and consequently in the scope of occupational safety and health, in both positive and negative ways.

Liberalization of world trade, rapid technological progress, significant developments in transport and communication, shifting patterns of employment, changes in work organization practices, the different employment patterns of men and women, and the size, structure and life cycles of enterprises and of new technologies can all generate new types and patterns of hazards, exposures and risks. Demographic changes and population movements, and the

consequent pressures on the global environment, can also affect safety and health in the world of work. Since occupational accidents and work-related injuries to health occur at the individual workplace, preventive and control measures within the enterprise should be planned and initiated jointly by the employer, managers and workers concerned. Measures for the prevention and control of occupational hazards in the workplace should be based upon a clear, implementable and well-defined policy at the level of the enterprise. The argument that lack of knowledge and understanding of OSH regulations determine the level of compliance within construction regulations is made by Windapo and Oladapo (2012), in that there is lack of awareness in most developing countries (especially Nigeria) for OSH regulations and practice, an issue that is also echoed by Idubor and Osiamoje (2013). Therefore, Diugwu, Baba, & Egila (2012) contend that lack of knowledge for details and implications hinder OSH management in the construction industry. They found that construction workers in Minna, Nigeria (if not the whole country) do not know the enforcer of OSH regulations in Nigeria. If workers do not know or understand the regulations, they will not know when their rights have been violated. Puplampu and Quartey (2012) note a similar issue that lack of adequate Information and statistics hinder the compliance with OSH in Africa; while Diugwu et al. (2012), Idubor and Osiamoje (2013) identify same for Nigeria. The above is explained by Diugwu et al.(2012), whose study argues that OSH information dissemination in Nigeria is ineffective, and has minimal impact to target groups, hence blaming the government for it. This demonstrates that enacting laws without adequate effort to make it available to the public is as a good as not formulating one at all.

Federal Republic of Nigeria (FRN)(2012) stated that the occupational safety and health policy represents the foundation from which occupational safety and health goals and

objectives, performance measures and other system components are developed. It should be concise, easily understood, approved by the highest level of management and known by all employees in the organization. The policy should be in written form and should cover the organizational arrangements to ensure occupational safety and health. In particular, it should:

i. allocate the various responsibilities for OSH within the enterprise;
ii. bring policy information to the notice of every worker, supervisor and manager;
iii. determine how occupational health services are to be organized; and
iv. specify measures to be taken for the surveillance of the working environment and workers' health.

The policy may be expressed in terms of organizational mission and vision statements, as a document that reflects the enterprise's occupational safety and health values. It should define the duties and responsibilities of the departmental head or the occupational safety and health team leader who will be the prime mover in the process of translating policy objectives into reality within the enterprise. The policy document must be printed in a language or medium readily understood by the workers. Where illiteracy levels are high, clear non-verbal forms of communication must be used. The policy statement should be clearly formulated and designed to fit the particular organization for which it is intended. It should be circulated so that every employee has the opportunity to become familiar with it. The policy according to Idoro (2008) should also be prominently displayed throughout the workplace to act as a constant reminder to all. In particular, it should be posted in all management offices to remind managers of their obligations in this important aspect of company operations. In addition, appropriate measures should be taken by the competent authority to provide guidance to employers and workers to help them comply with their legal obligations. To ensure that the

workers accept the safety and health policy objectives, the employer should establish the policy through a process of information exchange and discussion with them. The policy should be kept alive by regular review. A policy may need to be revised in the light of new experience, or because of new hazards or organizational changes. Revision may also be necessary if the nature of the work that is carried out changes, or if new plant or new hazards are introduced into the workplace. It may also be necessary if new regulations, codes of practice or official guidelines relevant to the activities of the enterprise are issued.

Employers' Responsibilities

(FGN)(2012) revealed that the safety and health policy should reflect the responsibility of employers to provide a safe and healthy working environment. The measures that need to be taken will vary depending on the branch of economic activity and the type of work performed; in general, however, employers should:

i. provide and maintain workplaces, machinery and equipment, and use work methods, which are as safe and without risk to health as is reasonably practicable;
ii. ensure that, so far as reasonably practicable, chemical, physical and biological substances and agents under their control are without risk to health when appropriate measures of protection are taken;
iii. give the necessary instructions and training to managers and staff, taking account of the functions and capacities of different categories of workers;
iv. provide adequate supervision of work, of work practices, and of the application and use of occupational safety and health measures;

v. institute organizational arrangements regarding OSH adapted to the size of the undertaking and the nature of its activities;

vi. provide adequate personal protective clothing and equipment without

vii. cost to the worker, when hazards cannot be otherwise prevented or controlled;

viii. ensure that work organization, particularly with respect to hours of work and rest breaks, does not adversely affect the safety and health of workers;

ix. take all reasonable and practicable measures to eliminate excessive physical and mental fatigue;

x. provide, where necessary, for measures to deal with emergencies and accidents, including adequate first-aid arrangements;

xi. undertake studies and research or otherwise keep abreast of the scientific and technical knowledge necessary to comply with the obligations listed above;

xii. cooperate with other employers in improving occupational safety and health.

Workers' Duties and Rights

The cooperation of workers within the enterprise is vital for the prevention of occupational accidents and diseases. The enterprise's safety and health policy should therefore encourage workers and their representatives to play this essential role: specifically, it should ensure that they are given adequate information on measures taken by the employer to secure occupational safety and health, appropriate training in occupational safety and health, and the opportunity to enquire into and be consulted by the employer on all aspects of occupational safety and health associated with their work. The policy according to FGN

(2012) should outline the duty of individual workers to cooperate in implementing the OSH policy within the enterprise. In particular, workers have a duty to:

i. take reasonable care for their own safety and that of other persons who may be affected by their acts or omissions;
ii. comply with instructions given for their own safety and health, and those of others, and with safety and health procedures;
iii. use safety devices and protective equipment correctly (and not render them inoperative);
iv. report promptly to their immediate supervisor any situation which they have reason to believe could present a hazard and which they cannot themselves correct;
v. report any accident or injury to health which arises in the course of or in connection with work.

Workers also have certain basic rights in respect of occupational safety and health, and these should be reflected in the enterprise's policy. In particular, workers have the right to remove themselves from danger, and to refuse to carry out or continue work which they have reasonable justification to believe presents an imminent and serious threat to their life or health. They should be protected from unforeseen consequences of their actions. In addition, workers should be able to:

i. request and obtain, where there is cause for concern on safety and health grounds, inspections and investigations to be conducted by the employer and the competent authority;
ii. know about workplace hazards that may affect their health or safety;

iii. obtain information relevant to their health or safety, held by the employer or the competent authority; and

iv. collectively select safety and health representatives.

Access to better information is a prime condition for significant, positive contributions by workers and their representatives to occupational hazard control. The enterprise policy should make sure that workers are able to obtain any necessary assistance in this regard from their trade union organizations, which have a legitimate claim to be involved in anything that concerns the protection of the life and health of their members.

2.1.2 Implementation of Occupational safety and health regulation in block industries

Implementation of regulations is very vital in ensuring the efficacy of regulations. Thus, researchers (like Anderson 2007; Idubor & Osiamoje 2013) opine that regulations without proper implementation are tantamount to no laws. In that Idubor & Osiamoje (2013) postulate that lack of strict implementation of Occupational safety and health (OSH) regulations enables non- compliance to OSH regulations. Whereas non-compliance to OSH regulations is a major contributor to the poor state of OSH in Nigeria, Diugwu et al. (2012) maintain that the failed OSH management system in Nigeria is due to the non-functional OSH regulations and provisions. On the other hand, it is argued that enforcement and compliance with OSH regulations are not the stand alone steps for improving OSH, as improving organizational culture can also improve OSH. However, it is worth noting that the benefits of proper enforcement of OSH regulations are evident in countries with remarkable health and safety records like the UK, USA, Germany and many other developed countries, which in turn support Anderson (2007); Diugwu, Baba, & Egila (2012); Idubor & Osiamoje (2013)

arguments substantially. Anderson (2007) believes that as the main objective of OSH legislation is to prevent accidents and ill health in the workplace, there should be effectiveness and accountability in the enforcement of OSH rules and regulations. The Nigerian Federal Ministry of Labour and Productivity (Inspectorate Division) enforces OSH regulations while the National Council for Occupational Safety and Health will enforce the Labour, Safety, Health and Welfare Bill of 2012 in Nigeria when passed into law. So far, the efficacy and accountability of The Federal Ministry of Labour and Productivity in the enforcement of OSH regulations in Nigeria are evidently questionable and poor, especially in the construction industry. Perhaps, this is because OSH enforcement is not the principal practice in Nigeria (Okolie & Okoye 2012). This is exemplified by studies by researchers such as (Diugwu et al. 2012; Idubor & Osiamoje 2013; Idoro 2008) that demonstrate the ineffective and nonfunctional state of the OSH regulatory system in Nigeria. The series of plane crashes, collapse of buildings, and high accident and fatality rates inter alia in Nigeria are further evidence. Given the recent increased infrastructural development in Nigeria, which will worsen the already failed OSH as accidents, injuries and fatalities will increase and the role of effective enforcement in achieving optimum OSH, it is pertinent to investigate the salient causes of the poor level of OSH implementation in Nigeria, so as to improve OSH implementation.

Okolie and Okoye (2012) lamented that occupational safety and health (OSH) in Nigeria has not received adequate attention and support. As a result, OSH statuary regulations and provisions are non- functional (Diugwu, Baba, & Egila, 2012), while the state of OSH in Nigeria is poor (Diugwu et al., 2012; Okolie & Okoye, 2012). According to Diugwu et al. (2012), the failed OSH system in Nigeria is due to the weak statutory OSH regulations and

provisions. Also, it can be argued that the appalling level of compliance with OSH regulations in Nigeria (Diugwu et al., 2012; Idubor & Oisamoje, 2013; Okolie & Okoye, 2012) contributes to the poor OSH in the construction industry. Meanwhile, the continued exclusion of the Nigerian construction industry by the existing Factories Act of 1990 (Diugwu et al., 2012; Idoro, 2008), and the inefficiency of the Federal Ministry of Labour and Productivity Inspectorate Division in overseeing OSH in Nigeria as empowered by the Factories Act (Umeokafor, Isaac, Jones and Umeadi, 2013) do not help compliance either, despite the higher likelihood of construction workers to be killed at work if compared with other industries (Odeyinka, Davison, & Olomolaiye, 2005). Consequently, the construction contractors adopt regulations from the UK and the USA (Idoro, 2008; Diugwu et al 2012), hence compliance and enforcement are marginal (Umeokafor et al., 2013). The above coupled with the tremendous impact of contextual issues on OSH management (Kheni, Dainty and Gibb, 2007) and that no detailed study of the subject of Nigerian context was found make it pertinent to investigate the issues that determine compliance with OSH regulations in Nigeria. Nzuve and Lawrence (2012) found that low level of inspection and examination of workplaces might determine the level of compliance with OSH regulations as evident in workplaces in Nairobi. The same can be said of Nigeria, where lack of enforcement characterises regulatory institutions (Idubor & Osiamoje, 2013), most laws appear to fulfill all righteousness or are used for political or victimisation reasons, and the institutions alleged and proved to be corrupt and arbitrarily exercise its powers (Onyeozili, 2005). These ill characteristics of the regulatory institution in Nigeria also weaken its legal system. The contention being that the efficiency and effectiveness of the OSH enforcement bodies may determine the level of compliance with OSH regulations in workplaces. These explain why researchers posit, that lack of: strict legislation enforcement (Idubor &

Oisamoje, 2013; Onyeozili, 2005); competent professionals, that is, OSH officers (Idubor & Oisamoje, 2013); trained safety officers (Okeola, 2009), all enable non-compliance with OSH regulations in Nigeria. However, although the quality of enforcement may be marginal, enforcement at organisational level perhaps via safety officers should be made mandatory to Nigerian construction contractors (Okeola, 2009), as it will improve OSH enforcement. Equally important, Idubor and Oisamoje (2013) argue that the weak legal structure and absence of law enforcement in Nigeria allow foreign companies to take advantage of the ineffective statutory regulation. The same can be said of the construction industry. That may also suggest that these foreign firms may not have plans to comply fully with the OSH regulations in Nigeria or have a OSH management system similar to those obtained in their countries of origin, as they intend to reduce expenses and added cost to construction outputs. Tanko and Anigbogu (2012) pen that the informal construction sector in Nigeria engages in informal construction activities, which constitute about 70% of construction outputs; meanwhile, Kalejaiye (2013) posits that the informal construction sector has little or no access to occupational health. Their main methods of project execution involve employing workforce who do not have ideas of adequate safety practices required, therefore cannot advise the client to comply with OSH regulations. The argument therefore is that if 70% of the construction activities are executed through the informal practice, the construction industry is shooting itself on the foot, as they will never conform to OSH regulations; rather, they contribute to majority of the unsafe construction activities, thus hindering OSH improvement. As such, to improve OSH regulation in Nigeria, greater attention should be given to this sector (Tanko and Anigbogu, 2012) perhaps through adequate regulation. However, It can be argued that the informal sector is difficult to regulate because of the nature of its operations. From the above, it is therefore not misleading to state that this sector

contributes hugely to non-compliance with OSH regulations in the Nigerian brick and block industry.

2.1.3 Occupational health and safety regulations in block industries

The occupational health and safety regulations in bricks and block industries in Nigeria is contained in the Factory Act of 1990. The content of the Nigerian Factory Act of 1990 sets out to make provisions that will safeguard the safety and health of the workers in any organization that employs people under the Nigerian labour law. It is intended to provide guidelines with respect to the following: general safety and health of workers; welfare of workers which entails anything to be done to improve the comfort of workers; and provision of safety tools and materials for effective and safe operations at work. According to the Federal Government of Nigeria (FGN)(1990) in the factory act, safety tools and materials that all bricks and block industries must provide include the following: safety helmet; hand gloves; safety boots; protective clothing (apron, overall); face protector; ear protector and respirator. The act stated that in the bricks and block industries in Nigeria, management and workers should be ready to obey all acts and regulations relating to safety of persons and equipment. In the Nigeria factory act, the detailed occupational health and safety regulations in the bricks and block industries are arrange in sections or parts. According to the factory act general provisions of 1990, a brief of the health and safety regulations are given below:

Cleanliness: Every factory shall be kept in a clean state, and free from effluvia arising from any drain, sanitary convenience or nuisance, and without prejudice to the generality of the foregoing provision –

(a) accumulations of dirt and refuse shall be removed daily by a suitable method from the floors and benches of workrooms, and from the staircases and passages;

(b) the floor of every workroom shall be cleaned at least once in every week by washing or, if it is effective and suitable, by sweeping or other method;

(c) all inside walls and partitions, and all ceilings or tops of rooms; and all walls, sides and tops of passages and staircases shall -

(i) where they have a smooth impervious surface, at least once in every period of twelve months be washed with hot water and soap or cleaned by other suitable method,

(ii) where they are kept painted with oil paint or varnished, be repainted or re-varnished at least once in every period of five years, and at least once in every period of twelve months be washed with hot water and soap or cleaned by other suitable method,

(iii) in the other cases, be kept whitewashed or colour washed, and the whitewashing or colour washing shall be repeated at least once in every period of twelve months.

Overcrowding:

(1) A factory shall not, while work is carried on therein, be so overcrowded as to cause risk or injury to the health of the persons employed therein.

(2) Without prejudice to the generality of the foregoing provisions, a factory shall be deemed to be so overcrowded as aforesaid if the number of persons employed at a time in any workroom is such that the amount of cubic space allowed for every person employed is less than four hundred cubic feet.

(3) Every workroom shall not be less than nine feet in height, measured from the floor to the lowest point of the ceiling or, where there is no ceiling, to the lowest point of the roofing material.

(4) If the Director of Factories is satisfied that owing to the special conditions under which the work is carried on in any workroom, the application of the provisions of subsection (2) or (3) of this section to that workroom would be inappropriate or unnecessary, he may by a certificate in writing except the workroom from those provisions subject to any conditions specified in the certificate.

(5) If an inspector so requires, there shall be posted in the workroom a notice specifying the number of persons, who, having regard to the provisions of this section, may be employed in that room.

(6) In calculating for the purposes of this section the amount of cubic space in any room, no space more than four metres from the floor shall be taken into account, and, where a room contains a gallery, the gallery shall be treated for the purposes of this section as if it were partitioned off from the remainder of the room and formed a separate room.

(7) The Minister may make regulations as respects any class or description of factory or parts thereof or any process, increasing the number of cubic metre which shall under this section be allowed for every person employed in a workroom.

Ventilation:

(1) Effective and suitable provision shall be made for securing and maintaining by the circulation of fresh air in each workroom the adequate ventilation of the room.

(2) The Minister may make regulations specifying a standard of adequate ventilation for factories or for any class or description of factory or parts thereof.

Lighting:

(1) Effective provision shall be made for securing and maintaining sufficient and suitable lighting, whether natural or artificial, in every part of a factory in which persons are working or passing.

(2) All glazed windows and skylights used for the lighting of workrooms shall, so far as practicable, be kept clean on both the inner and outer surfaces and free from obstruction, provided that this subsection shall not affect the whitewashing or shading of windows and skylights for the purpose of mitigating heat or glare.

(3) The Minister may make regulations specifying a standard of suitable and sufficient lighting for factories or for any class or description of factory or parts thereof, or for any process.

Drainage of floors:

Where any process is carried on which renders the floor liable to be wet to such an extent that the wet is capable of being removed by drainage, effective means shall be provided and maintained for draining off the wet.

Sanitary conveniences:

(1) Sufficient and suitable sanitary conveniences for the persons employed in the factory shall be provided, maintained and kept clean, and effective provision shall be made for lighting the conveniences and, where persons of both sexes are or are intended to be employed (except

in the case of factories where the only persons employed are members of the same family dwelling there), such conveniences shall afford proper separate accommodation for persons of each sex.

(2) The Minister may make regulations determining for factories or for any class or description of factory what is sufficient and suitable provision for the purposes of this section.

Duty of inspector as to sanitary defects remediable by local authority:

(1) Where an inspector finds any act or default in relation to any drain, sanitary convenience or water supply or any nuisance or other matter in a factory which appears to him to be the concern of any local government under any law, he shall give notice thereof in writing to the local government council.

(2) If a period of three months has elapsed since the giving of such notice to the local government council concerned and the nuisance remains unabated, the inspector shall take such action as he deems necessary to abate the nuisance, and the owner or occupier of the premises shall bear the cost thereof.

In relation to machineries and heavy equipment, the factory act of 1990 made the following general provisions:

Prime mover:

(1) Every flywheel directly connected to any prime mover and every moving part of any prime mover, except any prime mover mentioned in subsection (3) of this section, shall be securely fenced, whether the flywheel or prime mover is situated in an engine-house or not.

(2) The head and tail race of every water wheel and of every water turbine shall be securely fenced.

(3) Every part of any electric generator, motor or rotary converter, and every flywheel directly connected thereto, shall be securely fenced unless it is in such a position or of such construction as to be as safe to every person employed or working on the premises as it would be if securely fenced.

Transmission machinery:

(1) Every part of any transmission machinery shall be securely fenced unless it is in such position or of such construction as to be as safe to every person employed or working on the premises as it would be if securely fenced.

(2) Efficient devices or appliances shall be provided and maintained in every room or place where work is carried on by which the power can promptly be cut off from the transmission machinery in that room or place.

(3) No driving-belt when not in use shall be allowed to rest or ride upon a revolving shaft which forms part of any transmission machinery.

(4) Suitable striking gear or other efficient mechanical appliances shall be provided and maintained and used to move driving-belts to and from fast and loose pulleys which form part of the transmission machinery, and such gear or appliances shall be constructed, placed and maintained as to prevent the driving-belt from creeping back on to fast pulley.

(5) The Director of Factories may by certificate in writing grant, subject to any conditions specified in the certificate, exemption from compliance with any of the requirements of

subsections (2), (3) and (4) of this section in any case where he is satisfied that compliance with the requirement is unnecessary or impracticable.

Powered machinery:

(1) Every power driven machine having its individual sources of power shall be provided with an efficient starting and stopping appliance or control.

(2) Every electrical equipment or appliance intended for use in a factory shall be of such construction as to be safe for use by all persons required to use same or who come into contact with same and shall be maintained at all times in a safe condition.

Other machinery:

(1) Every dangerous part of any machinery, other than prime movers and transmission machinery, shall be securely fenced unless it is in such a position or of such construction as to be as safe to every person employed or working on the premises as it would be if securely fenced, provided that, in so far as the safety of a dangerous part of any machinery cannot by reason of the nature of the operation be secured by means of a fixed guard, the requirements of this subsection shall be deemed to have been complied with if a device is provided which in the opinion of the Director of Factories satisfactorily protects the operator or other persons from coming into contact with that part.

(2) Any part of a stock-bar which projects beyond the headstock of a lathe shall be securely fenced unless it is in such a position as to be as safe to every person employed or working on the premises as it would be if securely fenced.

Provisions as to unfenced machinery:

(1) In determining, for the purposes of the foregoing provisions of this Part of this Act, whether any part of any machinery is in such a position or of such construction as to be as safe to every person employed or working on the premises as it would be if securely fenced

(a) no account shall be taken of any person carrying out, while the part of machinery is in motion, an examination thereof or any lubrication or adjustment shown by such examination to be immediately necessary, being an examination, lubrication or adjustment which it is necessary to carry out while the part of machinery is in motion; and

(b) in the case of any part of transmission machinery used in any process in any factory with respect to which the Director of Factories has declared, by certificate in writing, that he-is satisfied that, owing to the continuous nature of such process, the stopping of that part would seriously interfere with the carrying on of the process in such factory, no account shall be taken of any person carrying out in the factory by such methods and in such circumstances and subject to such conditions as may be specified in the certificate.

2.1.4 Block Making Processes and Procedures

Brick and block are the most popular building materials in Nigeria used for construction of residential and industrial buildings. In bricks and block making, the input materials are aggregate, cement and water which are mix and fed into the block making machine. Vibraform machines are conventional concrete brick, block and paver making machines. They make product by compressing and vibrating river sand, crusher dust, stone, ash, slag and other aggregates mixed with cement and water. Vibraform machines are available in diesel or electric options. Aggregate is the stone, sand and ash you want to vibrate and

compact down and bind together with the cement. A good aggregate is an aggregate that is free from chemicals, clay and organic material. A good aggregate will bond well with the cement paste and not react with it. As a rule of thumb, the denser your finished brick or block the stronger the brick or block will be. You must choose your aggregates according to your needs. To achieve a dense block with an aggregate that can be vibrated and compacted down easily you need to have an aggregate with evenly graded particles ranging from fine dust up to larger stone of around 9mm. Blending different aggregates/graded materials often produces the best results. The block density is a good indicator of weight. By weighing the block, you will be able to ascertain its density. Always be aware of breakages to the corners and edges of your product. Strength can be tested by knocking two blocks together after curing and being dried out. A ringing sound indicates good strength while a hollow sound means that the blocks are weak (Baiden & Tuuli, 2004).

The type and choice of the tools and equipment depends on the operation to be carried out or the type of bricks or block to be produce. In Nigeria, brick making is a resource intensive and highly polluting industry, most of the processes deployed in brick making are with low inputs of technology and archaic techniques. The choice of technology for firing of bricks depends generally on factors such as scale of production, soil and fuel availability, availability of skilled manpower and business considerations such as profitability and availability of finance. The popular brick making technologies are clamps, movable chimney and more recently fixed chimney kilns. The small scale brick entrepreneurs are confronted with environmental regulation and face numerous challenges for survival, considering the situation that there are very limited options for them to adopt for their brick business. The workers in the brick industry are subject to extreme working conditions and poor

remuneration The raw materials for bricks making are soil, water and coal. The environmental problems in the brick industry have been exacerbated by cheap access to resources such as soil, water, coal, biomass and labour.

This results in irreversible environmental damage in terms of depletion of top soil, water and coal. Soil being the raw material for brick making, is being consumed in huge amount by the brick industry. The kiln itself occupies considerable land which is subjected to high temperature making it unfit for agriculture in future (after the site is abandoned). The fast depletion of arable land thus caused due to brick making is a matter of grave concern to India. Addressing this issue, utilization of fly ash by all kilns within 100 km radius from thermal power plants has been made mandatory. Brick industry also consumes considerable amount of water. Most of the brick kilns are therefore sited along the Gangetic belt. However water utilization is generally regulated by local Govt. authorities. In advent of water scarcity, water intensive industries are temporarily closed down by the authorities to preserve water for drinking and other necessary usages. The wasteful utilization of coal by the brick sector accelerates the depletion of this valuable national resource.

British Standard (BS)(2003) defined a block as a masonry unit of larger size in all dimensions than specified for bricks but no dimension should exceed 650mm nor should the height exceed either its length or six times its thickness. For a long time in Nigeria, sandcrete blocks are manufactured in many parts of the country without any reference to suit local building requirements or good quality work (Oyekan and Kamiyo, 2008). In the year 2000, and in an attempt to enhance the best materials and manufacturing practice, the Standard Organization of Nigeria (SON) developed a reference document which prescribed the minimum requirements and uses of different kinds of sandcrete blocks (Nigerian Industrial

Standard for sandcrete block). Among the objectives of this NIS document are to ensure that all block manufacturers meets a minimum specified standard, as well as to control the quality of blocks produced by these manufacturers. The Nigerian Industrial Standard (NIS) for sandcrete block is a standard reference document developed by the SON which prescribes the minimum requirement and uses of sandcrete blocks.

These requirements include the quality of materials, the methods and procedure to employ for production and testing of the final products to ensure compliance to prescribed standard. The first standard for sandcrete block in Nigeria was developed in 2000 and known as NIS 2000; Standard for Sandcrete blocks. In 2004, the document was reviewed and NIS 2004; Standard for Sandcrete blocks became the country's standard reference document for sandcrete block. The last review was done in 2007 from which NIS 2007; Standard for Sandcrete blocks emerged as the latest standard reference document for sandcrete block production in Nigeria.

Sandcrete Block

Block is a composition of usually (1:6) mix of cement and sharp sand with the barest minimum of water mixture, and in some cases admixture, moulded and dried naturally. NIS 87:2000 defines sandcrete block as a composite material made up of cement, sand and water, moulded into different sizes. According to them, they are masonry units which when used in its normal aspect exceeds the length or width or heights specified for bricks. The block can therefore be made either in solid and hollow rectangular types (for normal wall) or decorative and perforated in different designs, patterns, shapes, sizes and types (for screen wall or sunbreakers). The jointing of beddings and perpends are 25mm thick in both the normal and

screen wall. Sandcrete blocks are widely used as walling units and over 90% of houses in Nigeria are being constructed of sandcrete blocks (Baiden and Tuuli, 2004). In the hardened state, sandcrete has a high compressive stress and this strength increase with density.

According to Nigerian Industrial Standard (NIS) (2000) and NIS (2004), the range of minimum strength specified in NIS 2000 is between 2.5N/mm2 to 3.45N/mm2. According to Abdullahi (2005) the quality of sandcrete blocks, however, is inconsistent due to the different production methods employed and the properties of constituent materials. Abdullahi studied the compressive strength of sandcrete blocks produced in some parts of Minna, Niger State, Nigeria and discovered that they were below the minimum NIS standard requirement. Oyetola and Abdullahi (2006) found that the crushing strength of sandcrete blocks increases with decreasing specific surface of sand and that curing of block by water sprinkling enhances their strength. Oyekan and Kamiyo (2011), Oyetola and Abdullahi (2006) and Rahman (1987) studied the possibility of using rice husk ash (RHA) in the production of sandcrete blocks and reported that the optimum water/cement + RHA ratio increases with rice husk ash contents and that up to 40%

RHA could be added as partial replacement for cement without any significant change in compressive strength at 60 days and 28days respectively. Compressive strength being the maximum stress sustained by the specimen, that is the maximum load registered on the testing machine divided by the cross sectional area of the specimen. Compressive strength is influenced by the level of quality control employed (Afolayan, Arum and Daramola (2008) good selection of materials and adequate curing method (Abdullahi 2005) among others. The NIS specified two types of blocks, types A (load bearing) and Type B (non–load bearing) and these blocks can also be solid or hollow. Other types of sandcrete blocks are decorative

and ventilating blocks which are sandcrete blocks without voids or webs normally used for non-load bearing wall construction. Hollow blocks are masonry units with core voided area greater than 25% of the gross area. Hollow sandcrete blocks are manufactured from light weight aggregate and are used for both load bearing and non-load bearing wall construction (Doan,2001). Originally, a decorative block was understood to be a solid block with decorative textured faces used to provide an attractive appearance and light, without need for burglar-proofing or any kind of louvers, shutters as well as to provide permanent ventilation without using ventilation blocks.

Materials Used in Making Sandcrete Blocks

Aggregate : According to UNESCO (2008) aggregates are mineral filler materials used in concrete. Materials like sand, gravel, crushed rock and other mineral fillers are used as aggregates. Aggregates which can be sourced from either natural or manufactured sources occupy about 75% of the volume of concrete (Taylor, 2002). Aggregate are classified according to BS 812 and BS 882 standards as coarse and fine. Coarse aggregates are materials at least 5mm in size and passing through 75mm mesh sieve and retained on a 5mm sieve. Fine aggregates are materials not larger than 5mm in size and which pass through a 5mm mesh sieve but will be completely retained on a 0.07mm mesh sieve. Particles of aggregate smaller than 0.06mm are classified as silt and clays and are considered as harmful ingredients (Taylor, 2002).

Fine Aggregate (Sand): Sand is the product of natural or artificial disintegration of rocks and minerals. Sand is an important constituent of most soil and is extremely abundant as a surface deposit along the course or rivers, on the shores of lakes and the seas and in arid

regions. As the term is used by geologists, sand particles range in diameter from 0.0625 to 2 millimeters. An individual particle in this size range is termed ‘sand grain’. The next smaller size class in geology is silt, particles smaller than 0.0625 mm down to 0.004 mm in diameter. Sand feels gritty when rubbed between fingers. Silt by comparison feels like flour or powder. Sand is commonly divided into five sub–categories based on size: (i) very fine sand (0.0625 mm to 0.125 mm), (ii) fine sand (0.125 mm to 0.25 mm), (iii) medium sand (0.25 mm to 0.5 mm), (iv) coarse sand (0.5 mm to 1 mm), and (v) very coarse sand (1 mm to 2 mm) (Oyetola & Abdullahi (2006). River sand particles are fine, but likely to vary in size and it is most suitable for plastering work.

Erosion sand is similar to river but coarser than river sand. It is cheaper than river sand and has higher crushing strength because of its coarse nature (Abdullahi,2005). Common sand is the most widely used sand. It is close to erosion sand in terms of grain size and has a tint of reddish brown colour which is retained when used. Lasisi and Osunade (1984) posited that the most economic sandcrete blocks can be made with common sand where the red tints associated with common sand is not a detrimental factor. Marine sand is often grained and fairly uniform in size. Fine sand is mostly used for plastering work with the sand grains passing through standard sieve as prescribed by American Society for Testing Materials (ASTM). Medium sand is **b**used for mortar in masonry work and the sand grains pass through the standard sieve and coarse sand is best for concrete work producing higher strength, its particles must pass through the standard sieve. Sand is used basically as filler in concrete, in making plastering mortar and sandcrete as the principal component of aggregate used in their production.

Cement: For constructional purposes, cement is a term restricted to the bonding materials used with stones, bricks and sand. The principal constituents of this type of cement are compounds of lime. On adding water to cement a chemical reaction known as hydration takes place and a

large quantity of heat is released. On hydration, gel is formed which binds the aggregate particles together and provides strength and water tightness to concrete on hardening. Ordinary Portland Cement (OPC) is the most common cement used in general concrete construction work. American Society for Testing Materials (ASTM) has specified certain physical requirement for each type of cement. These properties include fineness, soundness and consistency, setting time, compressive strength, heat of hydration, specific gravity and loss of ignition. Each of these properties has influence on the performance of cement. The fineness of cement, for example, affects the rate of hydration and the degree of fineness of cement is the measure of the mean size of the grain in it (Duggal, 2003). Portland cement to be used for the production of sandcrete blocks must comply with all the prescribed requirements in NIS 2004 respectively.

Water: The strength and workability of sandcrete depends greatly on the amount of water used in mixing. The purpose of using water is to cause the hydration of cement. Water to be used for the production of concrete or sandcrete must be free of suspended particles, inorganic salts, acids and alkalis, oil contamination and algae. In the production of sandcrete blocks is necessary for mixing cement and sand, to wash aggregates and in curing of blocks after manufacturing them. Potable water is recommended for use in the production of sandcrete blocks (NIS, 2007).

2.1.5 Occupational Health Hazards, Occupational Safety and Health Management

Safety is the state or condition of being free from danger, hazard, injury or accident. Mwombeki (2005) defines accidents as an unplanned and unexpected occurrence, which upsets a planned sequence of work; resulting to loss of production, injury to personnel, damage to plant and equipment and eventually interrupting production flow. Operationally, Occupational health hazard refers health related dangers and risk associated with workers in the bricks and block making industry. The concept Occupational Health and Safety (OHS) is a cross-disciplinary area concerned with protecting the safety, health and welfare of people engaged in work or employment. This is a new domain which forms the basic focus of most safety and health agency in every country of the world such as the United States Occupational Safety and Health Administration (OSHA) and the factories Act 1990 which is a law regulating safety, health and welfare of workers in factories in Nigeria.

Benjamin (2008) generally defined Occupational safety and health (OSH) as the science of the anticipation, recognition, evaluation and control of hazards arising in or from the workplace that could impair the health and well-being of workers, taking into account the possible impact on the surrounding communities and the general environment. The goal of all occupational health and safety programs is to foster a safe work environment. The International Labour Organization (ILO, 1996) defines occupational health and safety as a discipline with a broad scope involving many specialized fields. In its broadest sense, it aims at:

i. the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations;

ii. the prevention among workers of adverse effects on health caused by their working conditions;

iii. the protection of workers in their employment from risks resulting from factors adverse to health;

iv. the placing and maintenance of workers in an occupational environment adapted to physical and mental needs; and

v. the adaptation of work to humans.

In other words, occupational health and safety encompasses the social, mental and physical wellbeing of workers. Successful occupational health and safety practice requires the collaboration and participation of both employers and workers in health and safety programmes, and involves the consideration of issues relating to occupational medicine, industrial hygiene, toxicology, education, engineering safety, ergonomics, psychology, among others. Occupational health issues are often given less attention than occupational safety issues because the former are generally more difficult to confront. However, when health is addressed, so is safety, because a healthy workplace is by definition also a safe work place.

A healthy workplace by World Health Organization (WHO)(1999) definition is one in which workers and managers collaborate to use a continual improvement process to protect and promote the health, safety and well-being of workers and the sustainability of the workplace by considering the following, based on identified needs:

i. health and safety concerns in the physical work environment;

ii. health, safety and well-being concerns in the psychosocial work environment including organization of work and workplace culture;

iii. personal health resources in the workplace; and

iv. ways of participating in the community to improve the health of workers, their families and other members of the community (WHO, 1999).

Occupational Risks and Hazards in the Bricks and Block Industries: There are an unlimited number of hazards that can be found in bricks and block industries and are caused by obvious unsafe working conditions, such as unguarded machinery, slippery floors or inadequate fire precautions. These insidious hazards (that is, those hazards that are dangerous but which may not be obvious) may be classified as follows:

i. Chemical hazards; arising from liquids, solids, dusts, fumes, vapors and gases;

ii. Physical hazards; such as noise, vibration, fire, poor sanitation radiation and extreme temperatures;

iii. Biological hazards; such as bacteria, viruses, infectious waste and infestations;

iv. Psychological hazards; resulting from stress and strain;

v. Hazards associated with the non-application of ergonomic principles, for example badly designed machinery, mechanical devices and tools used by workers, improper seating and workstation design, or poorly designed work practices (Mock, Adjei, Acheampong, Deroo & Simpson,2005).

Most workers are faced with a combination of these hazards at work.

Occupational Health Management: Occupational health case management is actually a system that tracks each incident that relates to employee health and safety. It integrates the entire plan of an organization into a unified whole that assumes complete responsibility for each employee. This means that it is concerned with prevention as it is with health care after an accident. The goal of Occupational Health and Safety is to do everything that can be done to prevent accidents and minimize illness. Ultimately, that is all that can be done, but it is also considerably more than has been done in the past (Cruickshank, 2010).

In occupational health case theory, the work environment is the first line of defense for worker health and safety. Compliance with Occupational Safety and Health Authority (OSHA) standards is taken for granted, but that is often the starting point for safety. Constant monitoring and auditing of the safety conditions of the workplace is essential. This monitoring includes the individual employee. A health record can be kept on the employee as part of their other employment records. This process starts with a physical examination appropriate to the type of work that is done. It would be followed up by routine safety meetings stressing health related issues such as safety gear and proper lifting techniques (ILO, 2001).

When a health issue develops, either as a result of illness or accident, the employee must be covered by a health plan that is part of the overall health care system. These selected health care providers must do more than just provide "medical insurance". They must also be aware of the health and safety situation of the employer as well as the employee. Careful follow up and record keeping of every health situation can provide ideas for improving the environment for others. Occupational health should no longer be taken for granted, but rather be managed and controlled for success in organizations (Cruickshank, 2010).

Roles and Responsibility in Occupational Health and Safety: The occupational health and safety of employees and visitors to workplace is an important issue for both employees and employers.

Employer's Role :According to Doan (2001), employers have the obligation to ensure that all their employees are protected from health and safety risks arising out of their work activities. This implies they have to: provide and maintain safe systems of work ;make arrangements for ensuring the safe use, handling, storage and transport of equipment or substances; and provide necessary information, instruction, training and supervision.

An integral part of an employer's duty is to engage in risk management processes in the workplace. This is a system which identifies the occupational health and safety risks that are relevant to a particular workplace. A risk management system should be flexible and up-to-date to reflect the safety issues associated with a company's daily operations. A risk management system involves identifying hazards, assessing risks, controlling the risks and reporting accidents (Doan, 2001).

Employee's Role : The roles of employers need to be complemented by employees. Specifically, they are supposed to work in a safe manner, be safety conscious on their jobs and co-operate with their employers in the health and safety measures they put in place. They must also work safely to protect themselves and others from injury. For example, they must not: move or deface signs; tamper with machine guards; or behave in a way that puts others at risk.

All employees share equal responsibility and so must obey all health and safety procedures, including correctly wearing all personal protective equipment provided. They should also

know emergency procedures, the location of the first aid kit and report any workplace hazards to employers (OHS Act, 2000). The role of both employers and employees are all focused towards ensuring safety in the workplace.

The aim of safety in an organization is to reduce the accidents among employees at the workplace. McSween (2003) revealed that unsafe work behavior occur as a result of physical environment, social environment, and workers' experience within the work environment. Promoting safe work behavior in bricks and block making industries demands strict adherence to the approved code of practice. Generally a code of practice is a set of rules according to which people in a particular profession are expected to behave or practice. The International Labour Organization (ILO) (1992) code of practice on health and safety in brick and block making industries provides guidelines in the implementation of the health and safety practice on bricks and block making sites for all categories of workers including casual workers. The document outline the steps that have to be taken, among others to provide adequate welfare facilities, personnel protective equipment appropriate for a job and provision and maintenance of safe working environment to all workers. Salient portions of the code of practice relevant to this study as stated in the laws of International Labour Organization, Occupational Safety and Health Administration (OSHA) and the Nigeria factories Act 1990 are explained and presented below:

Welfare Facilities: Under the general provisions of welfare facilities, it writes "at or within reasonable access of every brick and block making site, the following facilities should, depending on the number of workers and the duration of the work, be provided, kept clean and maintained.

i. Sanitary and washing facilities or showers;

ii. Facilities for changing and for the storage and drying of clothing:

iii. Accommodation for taking meals and for taking shelter during interruption of work due to adverse weather conditions.

Sanitary Facilities: The Sanitary facilities are defined to include toilet, privies, chemical closet. The understanding from the document is that, the provision, the construction and the installation of these facilities should comply with the requirements of the authorities (laws of the land). Further, no toilet other than a water flush toilet should be installed in any building containing sleeping, eating or other living accommodation, and should be adequately ventilated and not open directly into occupied rooms. Adequate washing facilities should be provided as near as practicable to toilet facilities.

Washing Facilities: The rules governing washing facilities (e.g. shower-bath) are that, the number and the standard of construction and maintenance of washing facilities should comply with the requirements of the authorities. Washing facilities should not be used for any other purpose and where workers are likely to be exposed to skin contamination by poisonous, infectious or irritating substances, or oil, grease or dust, there should be a sufficient number of appropriate washing facilities or shower-baths supplied with hot and cold water.

Drinking Water: The code requires that, bricks and block making contractors must provide enough water for all' workers and the treatment of the drinking water will be as follows. All drinking water should be from a source approved by the authorities. Where such water is not available, the authorities should ensure that the necessary steps are taken to make any water

to be used for drinking fit for human consumption. Drinking water for workers should be stored in closed containers only, from which the water should be dispensed through taps or cocks. If drinking water has to be transported to the worksite, the transport arrangements should be approved by the authorities. The transport tanks, storage tanks and dispensing container should be designed, used, cleaned, and disinfected at suitable intervals in a manner approved by the authorities. Water that is unfit to drink should be conspicuously indicated by notices prohibiting workers from drinking it. A supply of drinking water should never be connected to a supply of water that is unfit to drink.

Facilities for Food and Drink: Contractors are required in appropriate cases, depending on the number of workers, the duration of the work and its location, provided adequate facilities for obtaining or preparing food and drmk at or near a bricks and block making site , if not otherwise available. The facilities should be hygienic and located in hygienic environment.

Living Accommodation: The code of practice requires that suitable living accommodation should be made available for all the workers at bricks and block making site which are remote from their homes. Adequate transportation between the site and their homes should be provided, and where this not possible ,other suitable living accommodation should be provided. Men and women workers should be provided with separate sanitary, washing and sleeping facilities.

Personal Protective Equipment and Protective Clothing: Under this provision, employers were to note that suitable personal protective equipment and protective clothing, having regard to the type of work and risks, should be provided and maintained by them without cost to the workers. Also under this provision, personal protective equipment and protective

clothing should comply with standards set by the authorities, taking into account as far as possible the ergonomic principles. Further, employers should provide the workers with the appropriate training to enable them to use the individual protective equipment, and should require and ensure its proper use.

Types of Protective Equipment and Protective Clothing: Employers are required by law to provide all workers including casual workers with the following personal protective equipment and protective clothing on bricks and block making site.

i. Safety helmets or hard hats to protect the head from injury due to falling or flying objects, or due to striking against objects ;

ii. Clear or colored goggles, a screen,, a face shield or other suitable device where workers are likely to be exposed to eye or face injury from airborne dust or flying cement particles, dangerous substances, harmful heat, light or other radiation, and in particular during welding, flame cutting, rock drilling, concrete mixing or other hazardous work;

iii. Protective gloves or gauntlets, appropriate barrier creams and suitable protective clothing to protect hands or the whole body as required, against heat radiation or while handling hot, hazardous or other substances which might cause injury to the skin;

iv. Footwear of an appropriate type when employed at places where there is the likelihood of exposure to adverse weather conditions, or of injury from falling or crushing objects, hot or hazardous substances, sharp-edged tools or nails and slippery or ice- covered surfaces;

v. Water proof clothing and head coverings when working in adverse weather conditions.

vi. Respiratory protective equipment, suitable for a particular environment, where works can be protected against airborne dust, fumes, vapors or gases by ventilation or other means.

From the above section, it can be concluded that the legal framework or code of practice for bricks and block making workers in general is adequate to protect them. The legal framework covers all categories of workers.

2.1.6 Benefits of promoting adherence to Occupational Health and Safety Regulations (OHSR) in Brick and Block industries

Generally, the introduction of occupational health in industries and other occupations can benefit everybody especially the management, the employers and the employees. The workplace is an ideal setting for promoting the health and well being of the employees and the employers. This is because a large number of the population spends greater number of their time and energy at work environment each day. In essence, the work place is the second home for any employer. Also Occupational health is meant not only for the worker but is extended to the family members and the entire community directly or indirectly. When the employees are healthy physically, emotionally and psychologically the atmosphere within the occupational setting becomes encouraging, relaxed and inviting. The productivity increases, the company stands better chance of growth. Introduction of occupational health into the companies reduces items of loss and cost reduction due to absenteeism as a result of illness and accidents.

Through occupational health, conditions that cause illness and accidents are far more reduced if not prevented. In summary, the benefits of promoting occupational health at work settings according to Ezenduka and Olubiyi (2010) include: improvement of worker's health behaviour due to relaxed atmosphere in the work setting; improved worker's health; improved workers moral and job-satisfaction; improved workers efficiency and productivity; lower sickness rates, lower accidents and injury rates; reduced absenteeism reduced labour turnover; reduced health cost to the employee, the management and the employers; improved corporate image and industrial relations.**;** lower compensation for occupational illnesses and injuries; and improved intra-personal and inter-personal relationship within the companies, the family and in the community.

Effects of Work on Health

Achalu (2000) revealed that the many benefits that can be obtained among others include: work serves to relieve boredom**;** it provides avenue for creativity**;** it serves as means of personal/economic gain and means of livelihood**;** it contributes to life satisfaction and happiness; it serves as source of challenge for human growth and development**;** it creates opportunity for socialization and companionship; good health increases capacity to work**;** it increases capacity to enjoy work**;** it increases capacity to desire satisfaction at work; it promotes productivity and increases worker's performance; it encourages emotional and psychological satisfaction**;** it reduces stress and promotes intra and interpersonal relationship in the work setting; it increases alertness to danger.

2.1.7 Ways of improving OHSR awareness and implementation in Brick and Block industries

There are many different systems for supervising and improving occupational safety and health. Dorman (1996) in his study identified three categories of improving OHS namely; A specification model- where laws and regulations are at the core and where the main actors are various types of experts. In Sweden, for example, the Working Environment Act provides for the establishment of a safety committee that plans and supervises safety activities. It also provides for the appointment of one or more workers' safety delegates who have wide powers of inspection and access to information. This combined force is authorized to order work to be suspended when it considers a situation to be dangerous, pending a ruling by the labour inspection service and despite opposition by the employer. No penalty can be imposed on a safety delegate whose decision to have the work suspended is not confirmed by the labour inspector, and the employer cannot claim any compensation for the suspension from the safety delegate or trade union organization.

A procedure-based model- where the potential of a rational systems approach is at the core and the line organization is the main actor, e.g. internal control. In principle, it is a system for monitoring the work environment and for defining remedial action, with a strong resemblance to modern quality control systems (Gustavsen, 1996). The idea is to identify errors and rely on the ordinary line organisation to correct them. Essentially, the point is to bring health and safety into the orbit of ordinary managerial concerns and actions.

In return for this involvement, management is given a certain authority to use its own discretion in defining problems and priorities. The role of the labour inspection is defined as

systems supervision where the primary point is to ensure that each enterprise has an adequate system in place. In general, it would seem that the participation of workers in the inspection of working conditions and the working environment will continue to increase, particularly in countries that have introduced "self -inspection regimes" or internal control was introduced in Norway and Sweden during the 1990´s. Such regimes depend, however, on effective and aggressive workers' organizations and their active involvement in the audit process at the enterprise level, which is the centre-piece of any such "self inspection‖.

A developmental model- where the principle of continuous improvement is at the core and the activity is distributed as widely throughout the whole organization as possible. Does the continuous improvement approach give advantages lacking in the two other approaches? Anderson (2007) once again argues that it does, this was based on a study of about 1300 Swedish workplaces. The study suggested that if there is broad active involvement, there will be strong positive improvements in work environment conditions as well as in productivity. When health and safety was part of an overall process of improvement and integrated with efforts to promote productivity there was a clear management motivation. The idea of continuous improvement is widespread in working life today. Originally introduced by the Japanese, it has become a globally accepted practice and in most versions active participation from all concerned is a part of the concept. In sum, all three approaches described above are important. While expert competence is necessary in dealing with, for instance potentially toxic substances, work postures can hardly be changed without some kind of participation from those concerned.

For works which by their very nature expose workers to hazards arising from the use or presence of chemical, physical or biological agents and climatic conditions, appropriate

preventive measures should be taken to avoid any danger to the safety and health of workers. The preventive measures should place emphasis on the need to eliminate or reduce the hazard at the source and in particular should according to (ILO, 1992) requires:

i. The replacement of hazardous substances, equipment or processes with substances, equipment or processes less harmful or hazardous to workers' safety and health;
ii. The reduction of noise and vibration caused by equipment, machinery, installations -and tools;
iii. Control of the release of harmful agents or chemicals into the working environment; training in manual lifting;
iv. Proper working postures when workers are required to work in fixed working positions or when they are carrying out repetitive work;
v. Appropriate protection against climatic conditions likely, to jeopardise health;
vi. Where the foregoing measures are inappropriate: instituting work practices which will eliminate or minimize danger to safety and health;
vii. Supplying and requiring the use of personal protective equipment and clothing.

ILO (1992) outlined the following steps required for improving safety and health of bricks and block making workers:

Workers should be adequately and suitably:

i. Informed of potential safety and health hazards to which they may be exposed at their workplace;

ii. Instructed and trained in the measures available for the prevention and control, and protection against those hazards.

A person has to receive the necessary information, instruction and training so as to be able to do the work competently and safely. The competent authority should, in collaboration with employers, promote training programmers to enable all the workers to read and understand the information and instructions related to safety and health matters. Information need to be understood by the worker and written, oral, visual and participative approaches should be used to ensure that the worker has assimilated the material.

National Laws or Regulations

According to FRN (1990) in the factory act of Nigeria, the national body guiding the bricks and block industry workers should provide:

i. The nature and length of training or retraining required for various categories of workers employed in bricks and block industry;

ii. The employer has the duty to set up appropriate training schemes or arrange to train or retrain various categories of workers.

iii. Wherever required by national laws and regulations, only operators holding a certificate of proficiency or license should be employed to operate sophisticated bricks and block making machines.

Training for Safety and Health Measures in Construction Site

Copies of the relevant safety and health rules, regulations, and procedures should be available to workers upon the commencement of and upon any change of employment. Control measure need to be provided concerning:

i. General rights and duties of workers at the construction site;
ii. Means, of access and exit both during normal working and in an emergency;
iii. Measures for good housekeeping;
iv. Location and proper use of welfare amenities and first-aid facilities provided in |pursuance of the relevant provisions of this code;
v. Proper use and care of the items of personal protective equipment and protective clothing provided to the worker;
vi. General measures for personal hygiene and health protection;
vii. Fire precautions to be taken;
viii. Action to be taken in case of an emergency;
ix. Requirements of relevant safety and health rules and regulations (FRN, 1990).

Reporting of Accidents and Diseases

National laws or regulations should provide for the reporting of occupational accidents and diseases to the competent authority. All accidents to workers causing loss of life or serious injury should be reported forthwith to the competent authority and an investigation of these accidents should be made. Other injuries causing incapacity for workers for periods of time as may be specified in national laws or regulations, and prescribed occupational diseases

should be reported to the competent authority within such time and in such form as may be specified.

However, it is worthy to note that creating appropriate ways of improving OHSR awareness and implementation in bricks and block industries is geared towards achieving the numerous benefits of promoting adherence to Occupational Health and Safety Regulations (OHSR) in bricks and block industries. Paramount to these benefits is accident prevention. Mwombeki (2005) enumerates four preventive approaches for accidents. These include safety plans, safety training and meeting, first aid and medical arrangement and management policy.

Safety Plans: Management of any construction firm has the responsibility of developing a comprehensive and written safety programme that is performance oriented. The information should include the basics of personal protective equipments, the proper use of tools and power equipments, safe work practice, company policy on safety, safety responsibilities, emergency procedure, among others. This document must be made available to every worker on site and adherent to it must not be compromised. The responsibility of the safety personnel shall be to draw up a safety plan, setting out the rules applicable to the construction or building site, and shall make any adjustment to the plan, ensure effective distribution and use of safety equipment.

Safety Training and Meeting: Safety training is an essential part of any safety and health programme. Safety personnel and site workers should be trained in hazard identification, control and method of encouraging safe practices. The safety training and meetings must emphasis the project's safety requirements, review past activities, plan ahead for new operations, discuss the causes of accidents on site and ways of preventing future occurrence.

This training should be provided in the language well understood by the workers (Hassanein and Hanna, 2007).

First Aid and Medical Arrangement: First aid facilities must be provided on site regardless of the size of the project and the number of workers on site. In case of any injury such as cuts, strips or trips; prompt treatment with first aid facility can help prevent further aggravation of such injury. The employer should be responsible for the provision of first aid facility and personnel at all time on site (Hassanein and Hanna, 2007).

Management Policy: The type of management policy or commitment to safety at workplace is very essential to the prevention of accidents. The various commitment of construction management are in drawing up of an effective safety plans, provision of protective equipments for all site workers and personnel, encourage safe working habits, incentives for safety and regular review of accident prevention or safety programmes.

All of these accident preventive measures and many more are required on bricks and block making industries and work sites to effectively prevent or reduce the occurrence of accident on bricks and block making industries and related work sites.

In the same vein, Health and Safety Executive (HSE.) (2007) and Occupational Safety and Health Administration (OSHA) (2005) outline preventive measures as: Wearing clothes that are appropriate to the work and weather condition on site; Wearing of hand gloves; Wearing of work traction boots at all times on site; Wearing of hardhats or helmet at anywhere on site; Provision of eyewear or goggle for welding purposes among others; Constant inspection and assessment of equipments, plants, tools and other site materials before use; Organizing effective safety training for all site workers and personnel whether on site or off site;

Provision of effective first aid facility and personnel on site; and Provision of barriers, signs or reflector around dangerous areas on bricks and block making site (e.g. barrier around trench and so on).

2.2 Theoretical Framework of the Study

The study adopted the behavioural theory as well as the theoretical models for economic cost of occupational injuries and diseases. In the brick and block industries, the level of implementation of occupational health and safety regulations to large extent depends on their behaviour of both workers and employers to occupational health and safety. The behavioural theory was propounded by John B. Watson (1878-1958) and further developed by B. F. Skinner (1904-1990).This behavioural pattern is enshrined in the behavioural theory of learning. The Behavioural Theory of Learning is based on the concept of psychology which saw its essence in the examination and analysis of that which is publicly observed and measured. Artheson (2003) revealed that John B. Watson (1878-1958) was the first to study how the process of learning affects our behavior, and he formed the school of thought known as Behaviorism. The central idea behind behaviorism is that only observable behaviors are worthy of research since other abstraction such as a person's mood or thoughts are too subjective. Artheson (2003) added that the most well known Behaviorist is B. F. Skinner (1904-1990). Skinner followed much of Watson's research and findings, but believed that internal states could influence behavior just as external stimuli. He is considered to be a Radical Behaviorist because of this belief, although nowadays it is believed that both internal and external stimuli influence our behavior. Behavioural Psychology is basically interested in how our behavior results from the stimuli both in the environment and within ourselves.

Behaviourists are of the view that behaviour should be explained by servable experiences, not by mental processes. Mental processes are defined as thoughts, feelings and motives that each individual experience but cannot be observed by others. Mental processes according to Santrock (2001) includes: students thinking about ways to solving problem; a teacher thinking good about student's efforts and students inner motivation to control their behaviour. For the behaviourist, these thoughts, feelings and motives are not appropriate subject matter for a science of behaviour because they cannot be directly observed. Salkind and Dabbagh (2005) reasoned that behaviourists believe that there is finite set of knowledge, and the role of the teacher is to transfer that knowledge into the brains of the individual learners. Ivan Pavlov (classical conditioning) is considered as proponents of the behaviourists theories. Classical conditioning is a type of learning in which an organism learns to connect or associate with stimuli (Ertmer and Newby, 2005). In classical conditioning, a neutral stimulus – such as the sight of a person becomes associated with a meaningful stimulus (such as food) and requires the capacity to elicit a similar response.

Classical conditioning can be involved in both negative and positive experiences of students in the classroom. Among the things in the child's schooling that produce pleasure because they have become classically conditioned are feelings that the learning environment will lead to some financial income in the future. For instance, a vocation could be neutral for a student until he/she joins in the practice of the skills involved in it which will eventually lead to financial income. Accordingly, students can develop fear of the classroom if they associate the classroom with criticism, particularly when they fail to carry out certain skills required of them resulting to criticism from teacher or more knowledgeable peers.

Operant conditioning also called instrumental conditioning (Santrock, 2001) is a form of learning in which the consequences of behaviour produce changes in the probability that the behaviour will occur. The main architect behind operant conditioning was B. F. Skinner, whose views built on the connectionists' view of Thorndike's classical conditioning. Okwubunka (1993) explained that the operant conditioning of skinner introduced scientific precision in studying the learning process in which his theory of operant reinforcement of behaviour gave improved interpretation of the behaviourist theories. According to Skinner (1938) in Maigida (2013), reinforcement is simply an event that increases the rate of responding to stimuli. These classes of learning theories expect the teacher to effect behavioural changes in students through successive and systematic modification of the environment and instructional materials to increase the probability of a desired response. The researcher beliefs appropriate manipulation of the behaviour of both workers and employers in brick and block industries in Niger state will help in enhancing better awareness and implementation of occupational health and safety regulations in brick and block industries in Niger state.

Theoretical Models for Economic Cost of Occupational Injuries and Diseases

The theoretical models for economic cost of occupational injuries and diseases was propounded by Briddle, E.A. Calculations of economic loss or burden can be based on a number of theoretical models. There is no definite model considered as the best among economists or policy analysts. Two approaches have been reviewed by Biddle (2001), and are considered dominant among the methods used to calculate the costs of injury, illness, or premature death: Cost-of-illness and willingness-to-pay. Both methods have strengths and

weaknesses. The theories underlying the approaches as well as their strengths and weaknesses and other approaches are discussed below:

Cost-of-Illness: The Cost-of-illness (COI) method estimates the value of an occupational injury, illness, or fatality by summing the value of two components: direct and indirect costs. Direct costs consist of the actual dollar expenditures associated with the injury or illness and include the value of all goods, services, and other resources that are consumed. They are the value of those resources that could have been used elsewhere if the injury or illness had not occurred. The most prominent direct costs are health care costs, which include physician's visits, prescription medicines, physical therapy, ambulance service, and hospitalization fees. Other direct costs include insurance administration costs, vocational rehabilitation, attendant care, and nursing home expenditures. These costs can be incurred in the present time or at some point in the future. There are three primary approaches to estimate indirect costs: the friction cost method, the human capital method, and the willingness to pay method.

Willingness to Pay Method: The willingness to pay approach measures the amount an individual would pay to reduce the probability of illness or mortality. There are various methods of determining an individual's willingness to pay, including surveys, examining the additional wages for jobs with high risks, examining the demand for products that lead to greater health or safety, and other related methods (Dorman, 1996). An underlying assumption of this theory is that workers in the labor market know and understand the risks associated with jobs and that they will undertake only the jobs that are within the limits of their risk tolerance. This implies that workers are willing to accept a certain level of job-related risk in return for a specific level of compensation. Additionally, a perfectly

competitive labor market would require establishment of equilibrium prices for each job characteristic that is equal to its marginal cost (Biddle 2001).

Individual worker preferences are partially determined by the labor market‘s demand for their particular skills. Job characteristics affecting safety levels include the fatality risk of the job, the nonfatal risk of the job, worker compensation benefits that are payable in case of injury on the job, and annuity benefits that are payable in the event of a fatal accident.

Furthermore, compensating wage models consider all risks to be the same. It can be argued that not all fatality risks represent the same utility loss. For instance, a worker may view death by fire as much more painful than immediate death in a motor vehicle incident, thereby creating different values for those deaths. People are usually less willing to accept involuntary risk than risk that is voluntarily assumed through contract of employment. Consequently, compensating-wage studies probably underestimate society‘s aversion to risk that is not contracted for. The most common criticism of compensating-wage approaches is that comparison of studies is almost impossible because of heterogeneity problems. This stems partly, from the large fluctuations in value of life estimates generated within the typical population. Therefore the application of the results of a compensating-wage study to the general population is inappropriate.

Human Capital Method : Briggs (1999) views the human capital method as one that measures the lost of production, in terms of lost earnings, of a patient or caregiver. For mortality or permanent disability costs, the approach multiplies the earnings lost at each age by the probability of living to that age. The earnings in future years are discounted and often a one percent real annual growth rate in earnings is assumed. The human capital approach

often includes the value of household work, usually valued as the opportunity cost of hiring a replacement from the labour

Friction Cost Method: A related method, the friction cost method, measures only the production losses during the time it takes to replace a worker. This approach assumes that short-term work losses can be made up by an employee and the loss of an employee only result in costs in the time it takes a new employee to be hired and trained, known as the friction period (Benichou,2001).

2.3 Related Empirical Studies

Several studies have been carried out relating to occupational safety and health of workers in building construction and related companies. Much empirical research evidence are lacking concerning the extent of awareness of workers on occupational health and safety regulations in the brick and block making industries in Niger state. For instance, Anosike and Oyebade (2012) carried out a study on "Sandcrete Blocks and Quality Management in Nigeria Building Industry". This study experimental research design on samples of sandcrete blocks. The objective of this research is to ensure that all block manufacturers meets a minimum specified standard. The study appraised this objective using field study, sampling and laboratory experimentation and results obtained revealed very low compliance with as low as 0.66N/mm2 compressive strength value and as much as 16.95% water absorption capacity. The study revealed that over 90% of physical infrastructures in Nigeria are being constructed using sandcrete blocks making it a very important material in building construction. The study revealed that poor quality control, poor selection of constituent materials and inadequate curing period by the manufacturers contributed to the negative results obtained.

Above study is related to this study because both studies investigated issues relating to sandcrete blocks. It is also related to this study because both studies were carried in building industry. The major differences between the above study and this study are in the method of data collection, the area of study, population and method of data analysis. The studies also differs in research design adopted.

Another study was carried out by Anosike (2011) on "Parameters for good site concrete production management practice in Nigeria". The study adopted descriptive survey design. This research investigated presence and effect of deleterious substances in materials of concrete on the quality of the concrete structure. Data from results obtained were also tested using 'ANOVA', 'Paired T-Test', 'Chi-Square' and 'Quality Control Charts' to test and validate the research hypothesis. Observations of concrete practice among project sites were undertaken and specimens of materials for concrete works from sampled „on-going" project sites were obtained and investigated in the laboratory for the presence of deleterious substances, aggregate particle size distribution, aggregates specific gravity and compressive strength. Results obtained revealed excessive content of chloride, carbon dioxide, nitrates, sulphates known to be destructive to concrete, in large quantities in some of the materials tested. The findings further revealed that their presence reduced drastically the compressive strength of the concrete elements produced with them. Recommendations include that concrete designers must urgently incorporate in the contract documents specifications for the compulsory test of proposed concrete materials by contractors before and during site concrete productions as an additional requirement to the traditional specification of mix ratios and compressive strength tests.

Above study is related to this study because both studies researched into professional practices relating to building construction industry in Nigeria. However both studies differ in their area of study, research design, method of data collection, data analysis among others.

Another study was carried out by Ikechukwu, Diugwu, and Baba (2012) on the "Effective Regulation and Level of Awareness: An Exposé of the Nigeria's Construction Industry". The study adopted descriptive survey design. The study revealed that the preparedness of any organization to minimize the frequency and severity of work related accidents, ill-health, and damage to property is demonstrated by the adoption of a health and safety management system. The impact of this, as demonstrated by the outcome of survey and literature review, is a general lack of awareness on important health and safety issues among Nigerian construction workers. Equally, there is an inability and or unwillingness by organizations to pay adequate attention to health and safety management. Consequently, the overall health and safety standard, operational capability and corporate image of Nigeria's construction industry have been affected.

Above study is related to this study because both studies researched into level of awareness of regulations and practices relating to building construction industry in Nigeria. Both studies differ in their area of study, research design, method of data collection, data analysis among others.

Another study was carried out by Rejoice (2011) on "Occupational health and safety of the informal service sector in the Sekondi-Takoradi metropolitan area". The study therefore seeks to examine the nature and operations of the informal service sector and the key health and safety risks associated with the sector. It also seeks to assess the economic costs of the

injuries and diseases and the interventions put in place by government, employers, and employees and finally make recommendations to inform policy. With the Sekondi-Takoradi Metropolitan Area as a case study, 440 employers and employees made up of Drivers, Beauticians, Mechanics and Porters were interviewed. Data was analyzed using the Statistical Package for Social Scientist (version 17). Other source of data was basically secondary specifically from books, journals and other relevant publications. The study revealed that the total economic costs of injuries and diseases among informal service workers in STMA was GH11,691.9 for the year 2010 and workers were exposed to a range of physical, ergonomic, chemical and psycho-social hazards. Despite these costs and level of exposure to hazards, 62.3 percent of the respondents had not registered under the National Health Insurance Scheme. Concerning Personal Protective Equipment (PPE), the survey revealed a collaborative effort between both employers and employees in their provision. It was also realised that Ghana has no Occupational Health and Safety (OHS) policy and the activities of OHS institutions were limited to the formal sector to the neglect of the informal sector and no compensations were paid to the workers in the sector. Furthermore, OHS institutions were under-resourced in terms of human resource and other logistics which hindered their service delivery even to the formal sector. It is therefore recommended that an OHS policy is formulated and intensive education through the media, undertaken to sensitize workers on their work environment and the level of risk exposure as well as the need to register under the NHIS. There is also the need for effective collaboration between all OHS institutions to ensure workers use the appropriate Personal Protective Equipment (PPE) to prevent injuries.

Above study is related to this study because both studies researched into Occupational health and safety issues and practices related to building construction industry. Both studies differ in their area of study, research design, method of data collection and data analysis.

Joshua and Lawal (2011) conducted another study on the "Cost optimization of sandcrete blocks through partial replacement of sand with lateritic soil" The study revealed a way in which lateritic soil within Ota, Ogun State of Nigeria could be used in the production of hollow sandcrete blocks. This replacement is intended to develop more economic sandcrete blocks since the cost of lateritic soil in Ota is much less than the cost of the conventional fine aggregate used in the production of sandcrete blocks without compromising the intergrity of the blocks. It was deduced from literatures that inclusion of lateritic soil in sandcrete block production results in a lesser quality blocks. However, this work found the maximum permissible replacement that still makes the blocks to be within the recommended standard. The blocks were produced with each lateritic soil sample from different sources replacing sand in steps of ten percent to 60% and their compressive strengths determined and compared with that of a standard sandcrete block to check for the acceptable percentage replacement. In the compressive strength test, 72 numbers of 225 x 225 x 450mm hollow laterised sandcrete block sizes were produced, cured and crushed to determine their twenty-eight-day compressive strength. Cost analysis performed discovered that the inclusion of the lateritic soil saves the cost of production by 11.89%. This percentage replacement can be recommended to the block molding industries within Ota with a view to reducing the production costs of the blocks.

Above study is related to this study because both studies investigated issues relating to sandcrete blocks. It is also related to this study because both studies were carried out within

the confine of building construction industry. The major differences between the above study and this study are in the method of data collection, the area of study, population and method of data analysis.

Another study was carried out by Atsumbe, Ohize, Abutu, & Amine (2013) on the "Assessment of industrial safety education programmes in manufacturing industries in Kaduna and Niger states of Nigeria". The study revealed that loss of working hours, low productivity and the loss of human and material resources due to negligence of safety and industrial safety education programme has become an incessant problem in manufacturing industries. The research study therefore focused on the assessment of industrial safety education programmes in the manufacturing industries of Kaduna and Niger states of Nigeria. The study sought to identify the industrial safety education training needs of the industries; the potential sources of industrial accidents in workshops/laboratories of manufacturing industries and the suitable instructional methods used by the industries to ensure safety and accident prevention in the industries. A 45 item questionnaire was used to collect data from management staff and factory workers from 24 manufacturing industries spread across Kaduna and Niger states of Nigeria. Mean and Standard Deviation were used for data analysis. The study among others found that: a conducive working environment greatly reduce potential sources of accidents and identifies appropriate industrial safety education training needs of the industries in addition to the instructional methods adopted. The study also recommended that: Federal Government should ensure monitoring and strict compliance with factories laws to save human and material resources and to create conducive working environment for industrial workers in Nigeria.

Above study is related to this study because both studies investigated issues relating to safety awareness in industries in Nigeria. Both studies are also similar in terms of method of data

collection and analysis. The major differences between the above study and this study are in the population, area of study and the industries involve; while the above study focus on manufacturing industries, this study focus on bricks and block making industries.

2.4 Summary of Review of Related Literature

In summary, the review on theoretical framework showed that in the bricks and block making industry, each developmental stage of maturation is characterized by acquisition of a higher-level structure of consciousness than the stage preceding it, although earlier levels of consciousness remain; that is, adults can display all three levels of consciousness. The registrative, interpretative, and integrative levels of consciousness govern the process of learning from experience through the selection and definition of that experience. Theoretical models for economic cost of occupational injuries and diseases were also reviewed.

The review of conceptual framework revealed that adequate legal framework or code of practice exists for protection of workers in the bricks and block making industries. Strict adherence to the awareness and implementation of the existing code of practice however appears difficult. It appears as if a lot of workers in the brick and block industries work for survival without paying attention to the occupational health hazard and safety practices surrounding their work places. The workers are also ignorant of the responsibilities and obligation of the industry in terms of health care provision for workers as well as the safety training needs of workers.

Also literature reviewed, revealed that there is no conclusive argument on : the level of awareness of workers on occupational health and safety regulations in the brick and block making industries level of implementation of occupational health and safety regulations in

brick and block industries; challenges to effective implementation of occupational health and safety regulations in brick and block industries; and the ways of improving implementation of occupational health and safety regulations in brick and block industries in Niger state. This has created a gap in terms of ignorance suffered by the workers in brick and block making industries. If nothing is done to improve the current practice a lot of workers are likely to suffer more health problems which will consequently disrupt smooth operational activities and reduce production capacity in the brick and block industries. The researcher hopes this study will fill the gap that exist in terms of the level of implementation of occupational health and safety regulations in brick and block industries in Niger state with a view of providing empirical evidence in this regard.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Research Design

Survey research design was used in carrying out this study. Questionnaire was used to determine opinions of the respondents on the level of implementation of occupational safety regulations in block industries in Minna metropolis. Olaitan and Nwoke (1999) defined a survey research design as a descriptive study in which the entire population or representative sample of the entire population is studied by collecting and analyzing data from the group through the use of questionnaires. Descriptive survey research design was chosen because it is effective in seeking peoples view about a particular issue that concerns them through the use of questionnaire (Uzoagulu,2011). Therefore, the survey design was considered suitable since the study sought information from a sample that was drawn from a population using questionnaire.

3.2 Area of the Study

The study was conducted in Minna metropolis of Niger state and covered the block making industries sampled from the five major towns (Bosso, Tunga, Chanchaga, Kpakungu and Gidan Kwano) in Minna metropolis of Niger state. Niger state is situated in the North central geo-political zone on Latitude of 3.20’ east and longitude 8 and 11.3’ north. Niger State shares its borders with republic of Benin (West), Zamfara State (North), Kebbi (North-West), Kogi (South), Kwara (South West), Kaduna (North-East) and the FCT (South-East).

3.3 Population

The target population for this study is 142 which comprises of 57 management staff (staff that performs the planning, coordination and supervisory functions) and 85 non management staff (staff that performs actually implement the managerial plans to achieve organization objectives regular of production of blocks) from the registered block making industries in Minna metropolis of Niger state. These data were gotten from the registered block making industries in Minna metropolis which are under the supervision of the Niger state branch of Standards Organization of Nigeria. The block making industries are registered with the association of brick and block making industries in Niger state.

3.4 Sample and Sampling Technique

Since the population of the study which is 142 is a manageable size, there was no need for sampling. Therefore, the entire population was used for the studied.

3.5 Instrument for Data Collection

The instrument used for data collection was a 39 items structured questionnaire on the level of implementation of occupational safety regulations in block industries in Minna metropolis. The instrument was divided into four sections. Section A is designed to obtain relevant background and personal data of the respondents, section B with 13 items was designed to obtain information from respondents on the level of implementation of occupational health and safety regulations in block industries, section C with 13 items was designed to obtain information from respondents on the challenges to effective implementation of occupational health and safety regulations in block industries, and section D with 13 items was designed

to obtain information from respondents on the ways of improving implementation of occupational health and safety regulations in block industries in Minna metropolis.

The questionnaire items were structured using five point rating scale with response options of : Highly Implemented (HI) rated 5 points, Moderately Implemented (MI) rated 4 points, Rarely Implemented (RI) rated 3 points, Not Implemented at all (NI) rated 2 points and Undecided (U) rated 1 point for research question two in section B; Strongly agreed (SA) rated 5 points, Agreed (A) rated 4 points, Disagreed (D) rated 3 points, Strongly Disagreed (SD) rated 2 point and Undecided (U) rated 1 point. This was used for research questions two and three in section C and D. Refer to appendix D for the instrument.

3.6 Validation of the Instrument

To ensure the validity of the instrument, the questionnaire was subjected to both face and content validation. Drafted copies of the questionnaire was given to three (3) lecturers in the department of Industrial and Technology Education, Federal University of Technology, Minna for validation. The validators were requested to check the suitability and simplicity of the items and add any other relevant items omitted in the instrument, and remove ambiguous and irrelevant statement in order to improve the structure of the items. All necessary corrections were effected in the items before administering the instrument to the respondents. For instance all items that were not relevant to the research question were deleted while some other items were rephrased. Also ambiguous items were simplified. See appendix B for validation certificate.

3.7 Reliability of the Instrument

A pilot study or trial study was conducted by administering questionnaire to twenty (20) respondents consisting of ten (10) management and ten (10) non management staff from block making industries in Kaduna. Kaduna which is outside the study area is selected for the pilot test to ensure reliability of the instrument. The response of the respondents from the trial testing or pilot testing was tested for reliability using Cronbach Alpha method to determine the internal consistency of the instrument. The instrument collected from the pilot test was scored and the scores obtained were computed using SPSS and the Cronbach Alpha reliability coefficient was found to be 0.87. Refer to appendix E for details of SPSS reliability result.

3.8 Administration of the Instrument

The questionnaires were administered to the respondents by the researcher with the aid of three research assistants. The administered instrument was collected after a period of one week. This was to allow the respondents to have enough time to objectively respond to the instrument. At the end of the field work the researcher recorded 92 percent instrument return rate, that is 238 questionnaires were administered to the respondents and 219 were returned.

3.9 Method of Data Collection

The method of data collection was through administering and collection of questionnaire from the respondents in the blocks industries.

3.10 Method of Data Analysis

Data collected for this study was analyzed using mean, standard deviation and z-test statistics. Mean and standard deviation was used to answer the research questions while z-test was used to test the hypotheses at 0.05 level of significance.

Decision on an item for the research questions are mean benchmark of 3.00. For items whose mean score is 3.00 or above, the decision is implemented while for items whose mean score is less than 3.00, is considered not implemented. Also, a z-test was used to test the hypotheses at 0.05 level of significant to compare whether the differences between the mean responses of the two groups were significant to accept or reject the null hypotheses. The z-test was considered suitable because the population was more than 30. All statistical analysis was done using the Statistical Package for the Social Sciences (SPSS). Where the z-probability value set by the computer was greater than 0.05 then the null hypothesis was accepted, but where the z-probability value was less than 0.05 then the null hypothesis was rejected and its alternative form accepted Refer to appendix H for SPSS breakdown and details of statistical calculations.

CHAPTER FOUR

4.0 PRESENTAION AND DATA ANALYSIS

4.1 Research Question 1

What is the level of implementation of occupational health and safety regulations in block industries?

Table 4.1
Mean and standard deviation of respondents on the level of implementation of occupational health and safety regulations

N1=57,N2=85, Total N=142

S/N	Items	$\bar{x}_A$	SD_A	Decision
1	Occupational Health & Safety (OHS) regulations concerning adequate personal protective clothing.	1.65	0.58	Not Implemented
2	Occupational Health & Safety regulations concerning adequate personal protective equipment.	1.73	0.59	Not Implemented
3	Occupational Health & Safety regulations concerning periodic training of workers in the application of safety techniques.	2.48	0.52	Not Implemented
4	Occupational Health & Safety regulations in provision of adequate sanitary facilities such as toilets and bathrooms.	3.39	0.52	Rarely Implemented
5	Occupational Health & Safety regulations in provision of adequate washing facilities for washing off poisonous & irritable substances.	1.58	0.57	Not Implemented
6	Implementation of Occupational Health & Safety regulations in provision of adequate food & treated drinking water.	1.63	0.56	Not Implemented
7	Occupational Health & Safety regulations in the provision of adequate work space to avoid overcrowding in workplace.	3.44	0.51	Rarely Implemented
8	Implementation of Occupational Health & Safety regulations in provision of adequate drainage systems at work place floors.	1.81	0.43	Not Implemented
9	Occupational Health & Safety regulations in provision of safety & guards on bricks & block making machine.	1.60	0.53	Not Implemented
10	Occupational Health & Safety regulations in organizing seminars & workshops on workplace safety.	1.74	0.52	Not Implemented
11	Occupational Health & Safety regulations in educating of workers on health hazards associated with bricks & block industries.	1.53	0.52	Not Implemented
12	Occupational Health & Safety regulations in provision of adequate machine spare parts for maintenance.	3.49	0.53	Rarely Implemented

13	Implementation of Occupational Health & Safety regulations in ensuring regular maintenance of bricks & block making machines.	3.45	0.54	Rarely Implemented

Key: $\bar{x}_{A=}$ Grand mean of both groups of respondents, SD_A=Average Standard Deviation, N1=Number of Management staffs (MS) in block industry, N2=Number of Non management staffs (NMS) in block industry.

The data presented in Table 4.1 shows that items 1, 2, 3, 5,6, 8,9,10 and 11 with grand mean ranged from 1.53-2.48 were not implemented by the Niger State block industry while items 4, 7 ,12 and 13 with grand mean ranged from 3.39-3.49 were rarely implemented by Niger State block industry. The decision on the items was arrive at based on the limit of numbers for the five points scale used for this study as it applies to research question one. This implies that items 4, 7, 12 and 13 are among the occupational health and safety regulations moderately implemented in block industries in Niger State, Nigeria. Table 4.1 also revealed that the standard deviation of the items ranged from 0.43-0.59 whose difference is less than 1.00. This implies that the both groups of respondents were not far from the mean and from one another in their responses.

4.2 Research Question 2

What are the challenges to effective implementation of occupational health and safety regulations in block industries?

Table 4.2
Mean and standard deviation of respondents on the challenges to effective implementation of occupational health and safety regulations

N1=57,N2=85, Total N=142

S/N	Items	$\bar{X}_A$	SD_A	Decision
1	Inadequate knowledge & understanding of Occupational Health and Safety (OHS) regulations in bricks & block industries (BBIs).	3.96	0.65	Agreed
2	Inadequate information on workers' rights in relation to OHS issues.	3.74	0.67	Agreed
3	Non strict adherence to OHS regulations by employers.	3.96	0.63	Agreed
4	Excess cost reduction tendency among owners of bricks & block industries.	3.72	0.74	Agreed
5	Negligence attitude of workers towards the use of personal protective clothing.	3.75	0.65	Agreed
6	Inadequate personal protective equipment in bricks & block industries. .	3.90	0.62	Agreed
7	Inefficiency of the federal ministry of labour and productivity inspectorate division in monitoring implementation of OHS regulations.	3.79	0.69	Agreed
8	Foreign nature of the OHS regulations adopted in Nigeria factory act.	3.73	0.67	Agreed
9	Lukewarm attitude of OHS officers towards strict enforcement of OHS regulations.	3.89	0.67	Agreed
10	Non availability of OHS representatives among management staff in BBIs.	3.67	0.67	Agreed
11	Informal nature of most bricks & block industries in Niger state.	3.90	0.64	Agreed
12	Absence of strict OHS regulations enforcement agency.	3.84	0.72	Agreed
13	High cost of training and retraining of workers on OHS issues.	3.82	0.67	Agreed

Key: $\bar{X}_{A=}$ Grand mean of both groups of respondents, SD_A=Average Standard Deviation, N1=Number of Management staffs (MS) in block industry, N2=Number of Non management staffs (NMS) in block industry.

The data analysis result from both groups of respondents as shown in Table 4.2 revealed that the listed items concerning the challenges to effective implementation of occupational health and safety regulations in Niger State block industries were agreed upon based on the real limit of numbers used. This is because the items have their grand mean ranged from 3.67-3.96 which fall within the real limit for agree. The opinion of the respondents implies that

Niger State block industries are faced with numerous challenges which have hindered effective implementation of occupational health and safety regulations in Niger State brick and block industries. Table 4.2 also indicated that the standard deviation of the listed items ranged from 0.62-0.74 whose difference is less than 1.00. This implies that the both groups of respondents were not far from the mean and from one another in their responses to research question two.

4.3 Research Question 3

What are the ways of improving implementation of occupational health and safety regulations in block industries?

Table 4.3
Mean and standard deviation of respondents on the ways of improving implementation of occupational health and safety regulations

N1=57,N2=85, Total N=142

S/N	Items	$\bar{x}_A$	SD_A	Decision
1	Developing effective occupational health and safety (OHS) plans in brick and block industries.	3.90	0.72	Agreed
2	Establishing a stricter OHS law enforcement agency that have authority over all brick and block industries.	3.78	0.66	Agreed
3	Regular review of workplace accident prevention & safety programmes.	4.14	0.63	Agreed
4	Regularly giving incentives to workers to enhance effective safety practice.	4.01	0.68	Agreed
5	Provision of adequate personal protective clothing in brick and block industries.	3.91	0.63	Agreed
6	Provision of adequate personal protective equipment in brick and block industries.	4.03	0.69	Agreed
7	Replacing of faulty machines guards on all bricks and block making machine.	3.76	0.76	Agreed
8	Regular provision of adequate first aid facilities.	3.92	0.64	Agreed
9	Training of workers on safety practices & administration & administration of first aids.	4.15	0.64	Agreed
10	Regularly organizing safety training & meetings for workers.	3.91	0.64	Agreed
11	Employing OHS experts in brick and block industries.	3.95	0.66	Agreed
12	Regularly reporting accidents & diseases associated with non compliance to OHS regulations.	3.90	0.72	Agreed
13	Making relevant safety & health rules available to workers in brick and block industries.	3.97	0.64	Agreed

Key: $\bar{x}_{A=}$ Grand mean of both groups of respondents, SD_A=Average Standard Deviation, N1=Number of Management staffs (MS) in block industry, N2=Number of Non management staffs (NMS) in block industry.

The data as shown in Table 4.3 revealed that the respondents agreed to all listed items since their grand mean ranged from 3.76-4.15 which fall within the real limit for agree based on the real limit of numbers used for this study. This implies that the listed items are among the possible ways of improving implementation of occupational health and safety regulations in block industries in Niger State. Table 4.3 also indicated that the standard deviation of the items ranged from 0.63-0.76 whose difference is less than 1.00. This implies that the two groups of respondents were not far from the mean and from one another in their responses concerning the ways of improving implementation of occupational health and safety regulations in block industries in Niger State, Nigeria.

4.4 Hypothesis One

H_{O1}: There is no significant difference in the mean responses of management and non management staff of block industry on the level of implementation of occupational health and safety regulations in block industries.

Table 4.4
Z-test analysis of the mean ratings of management and non management staff of block industry on the level of implementation of occupational health and safety regulations

Group	N	$\bar{x}$	SD	Df	z-value	p-value, Sig. (2-tailed)	Alpha Level	Decision
MS	57	2.35	1.02	140	3.648	0.000*	0.05	Rejected
NMS	85	2.18	0.99					

*Significant at $p \leq 0.05$.
Key: p-value=probability value calculated by the computer.

From Table 4.4 since the p-value, Sig. (2-tailed) (0.000) is less than 0.05, it implies that there is significant difference in the mean responses of the respondents. Therefore the null hypothesis regarding the level of implementation of occupational health and safety regulations in block industries in Niger State was rejected. Hence, there is a significant difference in the mean responses of management and non management staff of block industry

on the level of implementation of occupational health and safety regulations in block industries in Niger State.

4.5 Hypothesis Two

H_{O2}: There is no significant difference in the mean responses of management and non management staff of block industry on the challenges to effective implementation of occupational health and safety regulations in block industries.

Table 4.5

Z-test analysis of the mean ratings of management and non management staff of block industry on the challenges to effective implementation of occupational health and safety regulations

Group	N	$\bar{x}$	SD	df	z-value	p-value, Sig. (2-tailed)	Alpha Level	Decision
MS	57	3.81	0.68	140	0.346	0.729	0.05	Accepted
NMS	8	3.82	0.67					

Key: p-value=probability value calculated by the computer.

From Table 4.5 since the p-value, Sig. (2-tailed) (0.729) is greater than 0.05, it implies that there is no significant difference in the mean responses of the respondents. Therefore the null hypothesis regarding the challenges to effective implementation of occupational health and safety regulations in block industries in Niger State was accepted. Hence, there is no significant difference in the mean responses of management and non management staff of block industry on the challenges to effective implementation of occupational health and safety regulations in brick and block industries in Niger State.

4.6 Hypothesis 3

H_{O3}: There is no significant difference in the mean responses of management and non management staff of block industry on the ways of improving implementation of occupational health and safety regulations in block industries.

Table 4.6
Z-test analysis of the mean ratings of management and non management staff of block industry on the ways of improving implementation of occupational health and safety regulations

Group	N	$\bar{x}$	SD	df	z-value	p-value, Sig. (2-tailed)	Alpha Level	Decision
MS	57	3.96	0.68	140	0.643	0.520	0.05	Accepted
NMS	85	3.94	0.68					

Key: p-value=probability value calculated by the computer.

From Table 4.6 since the p-value, Sig. (2-tailed) (0.520) is greater than 0.05, it implies that there is no significant difference in the mean responses of the respondents. Therefore the null hypothesis regarding the ways of improving implementation of occupational health and safety regulations in block industries in Niger State was accepted. Hence, there is no significant difference in the mean responses of management and non management staff of block industry on the ways of improving implementation of occupational health and safety regulations in brick and block industries in Niger State.

4.7 Findings of the Study

Based on the data collected and analyzed, the following findings were made:

1. Several occupational health and safety regulations stipulated for block industries are not being implemented in Niger State brick and block industries; however the regulations regarding provision of adequate sanitary facilities, adequate work space plus machine spare parts for maintenance, as well as regular maintenance of block making machines are rarely implemented.

2. The challenges to effective implementation of occupational health and safety regulations in block industries in Niger State are numerous. The challenges among others include: excess cost reduction tendency among owners of block industries, inadequate safety facilities in block industries, high cost of training and retraining of workers on Occupational Health and Safety (OHS) issues, negligent of government to informal sector block industries, foreign nature of the OHS regulations adopted in Nigeria factory act, as well as inadequate knowledge and understanding of OHS regulations in block industries.
3. The ways of improving implementation of occupational health and safety regulations in Niger State block industries among others include: provision of adequate OHS facilities in block industries, regular training and retraining of workers on OHS regulation implementation and practices, developing more stricter Nigeria based OHS regulations plus policy plans in block industries, regularly giving incentives to workers to enhance effective safety practices.
4. There is a significant difference in the mean ratings of management and non management staff of block industry on the level of implementation of occupational health and safety regulations in block industries in Niger State, Nigeria.
5. There is no significant difference in the mean ratings of management and non management staff of block industry on the challenges to effective implementation of occupational health and safety regulations in block industries in Niger State, Nigeria.
6. There is no significant difference in the mean ratings of management and non management staff of block industry on the ways of improving implementation of occupational health and safety regulations in block industries in Niger State, Nigeria.

4.8 Discussion of Findings

Findings on the level of implementation of occupational health and safety regulations in block industries revealed that several occupational health and safety regulations stipulated for block industries are not being implemented in Niger State block industries; however the regulations regarding provision of adequate sanitary facilities, adequate work space plus machine spare parts for maintenance, as well as regular maintenance of block making machines are rarely implemented. This non implementation of several of the stipulated occupational health and safety regulations in Niger State block industries could be the cause of the rising cases of industrial accident and occupational diseases and hazards prevalent among workers in block industries in Niger State. The rare implementation of OHS regulations regarding provision of adequate sanitary facilities, adequate work space plus machine spare parts for maintenance, as well as regular maintenance of block making machines could be attributed to vital relevance critical nature of these regulations to block production activity and profit making which is of more importance to owners of block industries in the informal sector in Niger State.

This findings is in agreement with the findings of Jain (2010) who in a study on OHS regulations implementation level among industrial workers attributed the high rate of accidents in industries to poor attitude of workers towards safety practices, poor attitudes of employers towards provision of safety awareness training courses and incomplete instructions on safe practices and technical know-how on the operation of tools, equipment and machineries. Similarly Ezenduka and Olubiyi (2010) in a study on occupational health and safety in selected Nigeria industries found out that industrial workers mostly in the informal sector industries operate machines without a guard, drop objects on their toes, or cut their hands because of misuse of tools. The non implementation of several of the

stipulated OHS regulations in industries and the poor work practices among others are the issues the promulgated 1990 Factory Act of Nigeria seeks to address. The Federal Republic of Nigeria (1990) in her Factory Act revealed that strict implementation of OHS regulations helps to reduce industrial accident and promote good occupational health as well as smooth production activity and output.

To buttress this, Ogunsanmi, Salako and Ajayi (2011) in a study on risk classification model for design and building projects found out that the workers in the bricks and block industries in Nigeria appear not to be fully aware of the responsibility of their employers as regard safety provision, healthcare and welfare. Ogunsanmi, Salako and Ajayi (2011) also added that the industries in Nigeria have not fully implemented the appropriate occupational health and safety regulations needed to be provided by employers for the benefit of employees and the company at large. Non implementation of OHS regulations could result in industrial accident leading to injury to workers, damages to equipment plus machines, loss of work hours as well as decrease in production target. Implementation of OHS regulations should therefore be to the overall interest of the industry and in obedience and adherence to the stipulated OHS regulations in the Nigeria factory act and not just for the purpose of reducing cost or making higher profit by block industries owners.

The z-test analysis on the level of implementation of occupational health and safety regulations in brick and block industries revealed that there is a significant difference in the mean responses of the respondents. Therefore, the null hypothesis regarding the level of implementation of occupational health and safety regulations in block industries in Niger State was rejected. This implies that several occupational health and safety regulations stipulated in the Nigeria factory act for block industries are not being implemented in Niger State block industries.

Findings on the challenges to effective implementation of occupational health and safety regulations in block industries showed that the challenges to effective implementation of occupational health and safety regulations in block industries in Niger State are numerous. The challenges among others include: excess cost reduction tendency among owners of block industries, inadequate safety facilities in brick and block industries, high cost of training and retraining of workers on Occupational Health and Safety (OHS) issues, negligent of government to informal sector block industries, foreign nature of the OHS regulations adopted in Nigeria factory act, as well as inadequate knowledge & understanding of OHS regulations in block industries. This is because the items have their grand mean ranged from 3.67- 3.96 which fall within the real limit for agree with respect to the real limit of numbers used for this study. The opinion of the respondents implies that Niger State block industries are faced with numerous challenges which have hindered effective implementation of occupational health and safety regulations in Niger State brick and block industries. The numerous challenges to effective implementation of occupational health and safety regulations in block industries could be attributed to negligence of Nigerian government to the activities of the informal sector which the Niger State block industries belong.

As a support to this findings, Kalejaiye (2013) in a study on occupational health and safety issues, challenges and compensation in Nigeria, found out that in spite of the numerous statutory provisions and expectations in the Nigeria factory act concerning OHS regulations in the industries, there is still a serious challenge in form of gap in health and safety management in brick and block making industries in Nigeria. This challenge according to Kalejaiye (2013) is largely due to a dysfunctional health and safety law, causing an apparent lack of regulation of health and safety in almost every sector of the economy.

In a similar study by Idubor and Oisamoje (2013) on exploration of health and safety management issues in Nigeria's efforts to industrialize, it was found out that employers and contractors in Nigeria's brick and block industry as well as other building construction firms are left to use their discretion in managing health and safety issues. Consequently, employers and contractors in trying to maximize profit, allocate little resources to health and safety management, rarely keep, report, or release accurate records of accidents and injuries occurring at their work sites (Idoro, 2004).

To corroborate these findings, Richard and Faye (2000) in a study on .epidemiologic research report in block industries. Found out that other challenges to lack of observant and poor implementation of OHS acts or regulations is the outbreak of occupational diseases and illnesses prevailing among workers in bricks and block industries. These diseases and illnesses according to Richard and Faye (2000) have numerous adverse effects on human health such as respiratory effects, chronic cough, dermatologic effects, reproductive effects, repeated trauma disorder, musculoskeletal disorders, cancer, injuries resulting from cataract/poor sight, skin diseases and disorders. Skin diseases or disorders peculiar to the bricks and block industries include contact dermatitis, urticaria, sunburn, skin cancer, eczema or rash caused by primary irritations and sensitizers.

In view of the above, Idoro (2008) noted that the challenges to effective implementation of occupational health and safety rules and regulations as a result of poor attitude of management staff of bricks and block industries to the provision of the factory law, leads to frequent sudden occurrence of industrial accidents, injuries, occupational diseases, ill health and dearth of accurate records on health and safety performance. The non compliance to the law makes it difficult to have meaningful improvement in health and safety standards in the block industry

in Nigeria. Idoro further lamented that owners and managers of block industries in Nigeria as well as several building construction industries appears seemingly not duty bound to establish management systems that could improve safety awareness and implement appropriate standards. Therefore there is need for owners of block industries as well as management and non management staffs of the block industries in Niger State to be mindful of the challenges to effective implementation of occupational health and safety regulations and make frantic effort to combat them.

The z-test analysis on the challenges to effective implementation of occupational health and safety regulations in block industries revealed that there is no significant difference in the mean responses of the respondents. Therefore the null hypothesis regarding the challenges to effective implementation of occupational health and safety regulations in block industries in Niger State was accepted. Hence, there is no significant difference in the mean responses of management and non management staff of block industry on the challenges to effective implementation of occupational health and safety regulations in block industries in Niger State.

Findings on the ways of improving implementation of occupational health and safety regulations in block industries indicated that the ways of improving implementation of occupational health and safety regulations in Niger State block industries among others include: provision of adequate OHS facilities in block industries, regular training and retraining of workers on OHS regulation implementation and practices, developing more stricter Nigeria based OHS regulations plus policy plans in block industries, regularly giving incentives to workers to enhance effective safety practices. This is because all the listed items have their grand mean ranged from 3.76-4.15 which fall within the real limit for agree based on the real limit of numbers used for this study. This implies that the listed items are among the possible

ways of improving implementation of occupational health and safety regulations in block industries in Niger State. The availability of numerous possible ways of improving implementation of occupational health and safety regulations is an indication that there is hope of revitalizing the Niger State block industries to ensure more effective level of implementation of occupational health and safety regulations in block industries in Niger state.

The findings on the possible ways of improving implementation of occupational health and safety regulations in block industries in Niger State concerning regular training and retraining of workers on OHS regulation implementation and practices was supported by Okorie (2000) who in a research study on developing Nigeria's workforce found out that the advancement in building construction technologies demand new work skills and as well as new educational requirements. Okorie (2000) added that common reactions to such advancement in building construction technologies and occupational skills have been the re-training of workers in order to update/upgrade their technical knowledge and vocational skills needed to carry out current practices. To buttressed this further, Okeola (2009) in a similar study on occupational health and safety (OHS) assessments in the construction industry found out that, measures to keep education and training in tune with the knowledge and skills needed in the world of work, school courses and curricula must be reviewed, enriched and updated regularly in line with changes that are taking place in the building construction industry.

The z-test analysis on the ways of improving implementation of occupational health and safety regulations in brick and block industries revealed that there is no significant difference in the mean responses of the respondents. Therefore the null hypothesis regarding the ways of improving implementation of occupational health and safety regulations in block

industries in Niger State was accepted. Hence, there is no significant difference in the mean responses of management and non management staff of block industry on the ways of improving implementation of occupational health and safety regulations in block industries in Niger State, Nigeria. This implies that the block industries owners in Niger State, Nigeria, management as well as non management staff of block industry need to look out for the possible ways of improving implementation of occupational health and safety regulations in block industries and adopt it to ensure more effective level of implementation of occupational health and safety regulations in block industries in Niger State.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Summary of the Study

The study investigated the level of implementation of occupational health and safety regulations in block industries in Niger state. The study specifically ascertained the level of implementation of occupational health and safety regulations in blocks industries; determined challenges to effective implementation of occupational health and safety regulations in block industries and also determined ways of improving the implementation of occupational health and safety regulations in block industries in Niger State , Nigeria.. Relevant literatures related to this study were reviewed under appropriate headings such as theoretical framework, conceptual framework, review of related empirical studies as well as summary of review of literature.

The study adopted survey research design on a population of 142 literate respondents gotten through purposive sampling technique. A 39 item questionnaire structured on a five point scale response options was used as instrument for data collection. The questionnaire was validated by three university lecturers, pilot tested in Kaduna State and reliability coefficient calculated and found to be 0.87 using Cronbach Alpha reliability statistics. During the field work, 142 questionnaires were administered to the respondents and 142 were returned. This statistically amount to about 100 percent instrument return rate. Data collected was analyzed using mean, standard deviation and z-test statistics. Mean and standard deviation were used to answer the three research questions while the z-test statistics was used to test the three null hypotheses at 0.05 level of significance. Statistical

computation was carried out using SPSS to ensure accuracy of data collected from the field work.

Findings of the study revealed that several occupational health and safety regulations stipulated for block industries are not being implemented in Niger State block industries; however the regulations regarding provision of adequate sanitary facilities, adequate work space plus machine spare parts for maintenance, as well as regular maintenance of block making machines are rarely implemented. It was also found out that the challenges to effective implementation of occupational health and safety regulations in block industries in Niger State among others include: excess cost reduction tendency among owners of block industries, inadequate safety facilities in block industries, high cost of training and retraining of workers on Occupational Health and Safety (OHS) issues, negligent of government to informal sector BBIs, foreign nature of the OHS regulations adopted in Nigeria factory act, as well as inadequate knowledge & understanding of OHS regulations in block industries.

The study also found out that the ways of improving implementation of occupational health and safety regulations in Niger State block industries among others include: provision of adequate OHS facilities in BBIs, regular training and retraining of workers on OHS regulation implementation and practices, developing more stricter Nigeria based OHS regulations plus policy plans in block industries, regularly giving incentives to workers to enhance effective safety practices. Findings of the study related to hypothesis one revealed that there is a significant difference in the mean ratings of the respondents on the level of implementation of occupational health and safety regulations in brick and block industries in Niger State. It was also found out that there is no significant difference in the mean ratings of the respondents on the challenges to effective implementation of occupational health and

safety regulations in block industries in Niger State as well as on the ways of improving implementation of occupational health and safety regulations in block industries in Niger State.

5.2 Implications of the Study

The findings of the study have great implication for the following benefiting stakeholders: management and non management staffs in block industries, building trade students, technical teachers, block industry, curriculum planners, Government and the society at large. This non implementation of several of the stipulated occupational health and safety regulations in Niger State block industries could be the cause of the rising cases of industrial accident and occupational diseases and hazards prevalent among workers in block industries in Niger State. The opinion of the respondents implies that Niger State block industries are faced with numerous challenges which have hindered effective implementation of occupational health and safety regulations in Niger State block industries. Therefore there is need for owners of block industries as well as management and non management staffs of the block industries in Niger State to be mindful of the challenges to effective implementation of occupational health and safety regulations and make frantic effort to combat them. The availability of numerous possible ways of improving implementation of occupational health and safety regulations is an indication that there is hope of revitalizing the Niger State block industries to ensure more effective level of implementation of occupational health and safety regulations in block industries in Niger state, Nigeria. This implies that the brick and block industries owners in Niger State, Nigeria, management as well as non management staff of brick and block industry as well as other benefiting stakeholders need to look out for the possible ways of improving implementation of occupational health and safety regulations in block industries and adopt it

to ensure more effective level of implementation of occupational health and safety regulations in block industries in Niger State.

5.3 Conclusion

The study investigated the level of implementation of occupational health and safety regulations in block industries in Minna, Niger state. Based on the findings of the study, it was concluded that several occupational health and safety regulations stipulated in the Nigeria factory act for block industries are not implemented in Niger State block industries; the regulations moderately implemented are those directly needed for the block industry owners to make profit at minimum cost. It was also concluded that the Niger State block industries are faced with numerous challenges which have hindered effective implementation of occupational health and safety regulations in Niger State block industries. Therefore there is need for owners of brick and block industries as well as management and non management staffs of the block industries in Niger State to be mindful of the challenges to effective implementation of occupational health and safety regulations and make frantic effort to combat them through adoption of the identified possible ways of improving implementation of occupational health and safety regulations in block industries in Niger State.

5. 4 Recommendations

Based on the findings from this study, the following recommendations were made:

1. The Niger State ministry of labour and productivity and other industrial stakeholders should intensify effort to ensure stricter implementation of occupational health and safety regulations in block industries in Niger state, Nigeria.

2. The Niger State government should pay more attention and invest in the activities of block industries in Niger State to overcome the challenges by enhancing provision of adequate facilities for safe operational activities.
3. OHS department in block industry in Niger state should ensure that, the management provides conducive working environment for its workers according to the laws of the Federation as contained in the factory act laws to enhance implementation.
4. Each block industry in Niger state should have a comprehensive safety education and industrial accident prevention programme in place for periodically training its workers to prevent accident and injury.
5. Each block industry in Niger state should have OHS department to be responsible for all safety education programmes of the industry and also ensure the strict compliance of all OHS regulations of the industry by its workers.
6. The Ministry of Employment, Labour and Productivity should ensure strict compliance with the Factories Act (Cap 126) of 1990 to save the lives of block industry workers who are contacting diseases daily due to lack of safety education and accident prevention programme in place.

5.5 Suggestions for Further Research

Based on findings and limitation of this research study, the following research topics are suggested for further research:

1. Assessment of occupational health and safety regulations in block industries in Federal Capital Territory, Abuja Nigeria.

2. Level of implementation of occupational health and safety regulations in block industries in North Western Nigeria.
3. Evaluation of production process of block industries in North Central States of Nigeria.

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APPENDIX A

List of selected block industries in zone A,B and C of Niger state registered with Standards Organization of Nigeria (SON)

S/N	Name of Brick and Block Industry in Zone A	Location
1	Alhaji Salihu Sule block industry.	Along Baddegi/Abuja road,Bida.
2	Ndazabo block industry.	Ndazabo,Bida.
3	Mesaga block industry.	Aso, Bida.
4	Alhaji Massalachi block industry.	Along Wuya road,Bida.
5	Amusha'ad block industry.	Off Polytechnic road, after AP filling station.
6	Niger state block industry.	CABS Bida.
7	Al-maki block industry.	Along Mokwa/illorin road, Bida
8	Yusuf Gaba block industry.	Behind school of nursing, Bida.
9	Engr Abubakar Babalayi block industry.	Down Sauki road,Bida.
10	Engr Emmanuel block industry.	Along Federal low cost housing, Bida.
S/N	**Name of Brick and Block Industry in Zone B**	**Location**
1	Gwari block industry	Opp. Custom office,western bypass, Minna.
2	Rafs and block industry	Opp.police secondary school, western bypass, Minna.
3	C.U. Olympic block industry	Near NECO ware house, western bypass, Minna.
4	Yamman groups block industry	Near custom office, western bypass, Minna.
5	Unik block industry	Opp. NNPC filling station, western bypass, Minna
6	Danco block industry	Maitumbi road.opp.MRS filling station.
7	God's hand block industry	Opp. NNPC filling station, western bypass, Minna
8	Jossy royal block industry	Norther bypass,near El-Amin bakery.
9	A/C block industry	Opp. Federal secretariat .junction w/bypass
10	Yauri block industry	Opp. NECO ware house, western bypass, Minna
S/N	**Name of Brick and Block Industry in Zone C**	**Location**
1	A & G block industry.	Dadin kowa area, Kontagora.
2	Ini block industry	Opposite new market,Kontagora.
3	Garkuwa block industry	Beside prison quarters, Kontagora.

4	Nasara block industry	Along Kwangwara F.C.E. road, Kontagora.
5	Alhaji Jubrin block industry	Argungu road,Kontagora.
6	Madugu block industry	Opposite prison quarters,Kontagora.
7	Inuwa block industry	By prison quarters, Kontagora.
8	Mamman Bello block industry	Opposite central mosque, Kontagora.
9	Baraje block industry	Federal low cost, Kontagora.
10	Aruwa block industry	Opposite Government hospital, Kontagora.

Source : Standards Organization of Nigeria (SON), Minna office.

APPENDIX B
Letter of Request for Instrument Validation

Department of Industrial and Technology Education,

School of Science and Technology Education,

Federal University of Technology Minna, Niger State.

Date…….

Dear Sir,

REQUEST FOR VALIDATION OF RESEARCH INSTRUMENT

I am an undergraduate student of the Department of Industrial and Technology Education (Building Technology), School of Science and Technology Education, Federal University of Technology Minna, currently undertaking a research project titled**: Assessment of the level of implementation of occupational safety regulations in block industries in Minna metropolis.**

Kindly read the attached questionnaire and assess its validity, your comments and suggestions that could enhance the validity of the instrument and also improve the quality of the instrument will be highly appreciated. I count on your co-operation while thanking you in anticipation.

Yours Faithfully,

Okoye Joseph Chigozie
2016/1/63827TI
BTech Research Student.

APPENDIX C

FEDERAL UNIVERSITY OF TECHNOLOGY MINNA
SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION
DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION

QUESTIONNAIRE ON LEVEL OF IMPLEMENTATION OF OCCUPATIONAL HEALTH AND SAFETY REGULATIONS IN BLOCK INDUSTRIES IN MINNA, NIGER STATE

SECTION A

Name of Block Industry:……..

Location:…….

STATUS: Management Staff ( ) Non Management Staff ( )
Management Staff (Manager, Assistant manager, Supervisors)
Non Manager (Brick and block machine operators and other trade workers)

Instructional Guide: Please read this questionnaire carefully and respond appropriately, indicate your opinion with a tick **(√)** as shown below in the five (5) point opinion rating scale

RESPONSE GUIDE

Response categories of section B

High Implemented (HI) =5 points

Moderately Implemented (MI) =4 points

Rarely Implemented (RI) =3 points

Not Implemented at all (NI) =2 points

Undecided (U) =1 points

Response categories of section C and D

Strongly Agree (SA) =5 points

Agree (A) =4 points

Disagree (D) =3 points

Strongly Disagree (SD) =2 points

Undecided (U) =1 point.

SECTION B

What is the level of implementation of occupational health and safety regulations in block industries?

S/No	ITEM	HI	MI	RI	NI	U
1.	Occupational Health & Safety (OHS) regulations concerning adequate personal protective clothing.					
2.	Occupational Health & Safety regulations concerning adequate personal protective equipment.					
3.	Occupational Health & Safety regulations concerning periodic training of workers in the application of safety techniques.					
4.	Occupational Health & Safety regulations in provision of adequate sanitary facilities such as toilets and bathrooms.					
5.	Occupational Health & Safety regulations in provision of adequate washing facilities for washing off poisonous & irritable substances.					
6.	Implementation of Occupational Health & Safety regulations in provision of adequate food & treated drinking water.					
7.	Occupational Health & Safety regulations in the provision of adequate work space to avoid overcrowding in workplace.					
8.	Implementation of Occupational Health & Safety regulations in provision of adequate drainage systems at work place floors.					
9.	Occupational Health & Safety regulations in provision of safety & guards on bricks & block making machine.					
10.	Occupational Health & Safety regulations in organizing seminars & workshops on workplace safety.					
11.	Occupational Health & Safety regulations in educating of workers on health hazards associated with bricks & block industries.					
12.	Occupational Health & Safety regulations in provision of adequate machine spare parts for maintenance.					
13.	Implementation of Occupational Health & Safety regulations in ensuring regular maintenance of bricks & block making machines.					

SECTION C

What are the challenges to effective implementation of occupational health and safety regulations in block industries?

S/No	ITEM	SA	A	D	SD	U
1.	Inadequate knowledge & understanding of Occupational Health and Safety (OHS) regulations in bricks & block industries (BBIs).					
2.	Inadequate information on workers' rights in relation to OHS issues.					
3.	Non strict adherence to OHS regulations by employers.					
4.	Excess cost reduction tendency among owners of bricks & block industries.					
5.	Negligence attitude of workers towards the use of personal protective clothing.					
6.	Inadequate personal protective equipment in bricks & block industries. .					
7.	Inefficiency of the federal ministry of labour and productivity inspectorate division in monitoring implementation of OHS regulations.					
8.	Foreign nature of the OHS regulations adopted in Nigeria factory act.					
9.	Lukewarm attitude of OHS officers towards strict enforcement of OHS regulations.					
10.	Non availability of OHS representatives among management staff in BBIs.					
11.	Informal nature of most bricks & block industries in Niger state.					
12.	Absence of strict OHS regulations enforcement agency.					
13.	High cost of training and retraining of workers on OHS issues.					

SECTION D

What are the ways of improving implementation of occupational health and safety regulations in block industries?

S/No	ITEM	SA	A	D	SD	U
1.	Developing effective occupational health and safety (OHS) plans in brick and block industries.					
2.	Establishing a more strict OHS law enforcement agency that have authority over all brick and block industries.					
3.	Regular review of workplace accident prevention & safety programmes.					
4.	Regularly giving incentives to workers to enhance effective safety practice.					
5.	Provision of adequate personal protective clothing in brick and block industries.					
6.	Provision of adequate personal protective equipment in brick and block industries.					
7.	Replacing of faulty machines guards on all bricks and block making machine.					
8.	Regular provision of adequate first aid facilities.					
9.	Training of workers on safety practices & administration & administration of first aids.					
10.	Regularly organizing safety training & meetings for workers.					
11.	Employing OHS experts in brick and block industries.					
12.	Regularly reporting accidents & diseases associated with non compliance to OHS regulations.					
13.	Making relevant safety & health rules available to workers in brick and block industries.					

APPENDIX D

Cronbach Alpha Reliability Statistics

Reliability

[DataSet1] C:\Users\user\Desktop\Reliability jobs\Peter reliability data set.sav

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	20	100.0
	Excluded[a]	0	0
	Total	20	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.868	39

Item Statistics 1

Item No.	Mean	Std. Deviation	N
ITEM1	2.5000	1.82093	20
ITEM2	4.2000	1.64157	20
ITEM3	2.3000	1.75019	20
ITEM4	2.5000	1.53897	20
ITEM5	2.3000	1.45458	20
ITEM6	2.0000	.00000	20
ITEM7	4.0000	1.77705	20
ITEM8	1.1500	.67082	20
ITEM9	2.0000	.00000	20
ITEM10	2.0000	1.77705	20
ITEM11	2.5000	1.82093	20
ITEM12	4.2000	1.64157	20
ITEM13	2.3000	1.75019	20

Item Statistics 2

Item No.	Mean	Std. Deviation	N
ITEM14	2.5000	1.53897	20
ITEM15	2.3000	1.45458	20
ITEM16	4.7000	.47016	20
ITEM17	4.7000	.47016	20
ITEM18	4.7000	.47016	20
ITEM19	4.7000	.47016	20
ITEM20	4.7000	.47016	20
ITEM21	2.5000	1.82093	20
ITEM22	4.2000	1.64157	20
ITEM23	2.3000	1.75019	20
ITEM24	2.5000	1.53897	20
ITEM25	2.3000	1.45458	20
ITEM26	3.0000	.00000	20

Item Statistics 3

Item No.	Mean	Std. Deviation	N
ITEM27	2.0000	.00000	20
ITEM28	1.0000	.00000	20
ITEM29	2.0000	.00000	20
ITEM30	2.0000	.00000	20
ITEM31	2.5000	1.82093	20
ITEM32	4.2000	1.64157	20
ITEM33	2.3000	1.75019	20
ITEM34	2.5000	1.53897	20
ITEM35	2.3000	1.45458	20
ITEM36	2.8000	4.54915	20
ITEM37	2.8000	4.54915	20
ITEM38	2.8000	4.54915	20
ITEM39	2.8000	4.54915	20

Item-Total Statistics 1

Item No.	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ITEM1	140.2000	703.116	.299	.861
ITEM2	138.5000	768.368	-.393	.883
ITEM3	140.4000	704.463	.299	.862
ITEM4	140.2000	749.326	-.195	.876
ITEM5	140.4000	703.411	.386	.860
ITEM6	140.7000	735.274	.000	.868
ITEM7	138.7000	700.747	.333	.860
ITEM8	141.5500	728.997	.161	.867
ITEM9	140.7000	735.274	.000	.868
ITEM10	140.7000	696.116	.384	.859
ITEM11	140.2000	703.116	.299	.861
ITEM12	138.5000	768.368	-.393	.883
ITEM13	140.4000	704.463	.299	.862

Item-Total Statistics 2

Item No.	Scale Mean if Item Deleted	Scale Variance if	Corrected Item-Total	Cronbach's Alpha if Item Deleted

		Item Deleted	Correlation	
ITEM14	140.2000	749.326	-.195	.876
ITEM15	140.4000	703.411	.386	.860
ITEM16	138.0000	724.316	.424	.865
ITEM17	138.0000	724.316	.424	.865
ITEM18	138.0000	724.316	.424	.865
ITEM19	138.0000	724.316	.424	.865
ITEM20	138.0000	724.316	.424	.865
ITEM21	140.2000	703.116	.299	.861
ITEM22	138.5000	768.368	-.393	.883
ITEM23	140.4000	704.463	.299	.862
ITEM24	140.2000	749.326	-.195	.876
ITEM25	140.4000	703.411	.386	.860
ITEM26	139.7000	735.274	.000	.868

Item-Total Statistics 3

Item No.	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ITEM27	140.7000	735.274	.000	.868
ITEM28	141.7000	735.274	.000	.868

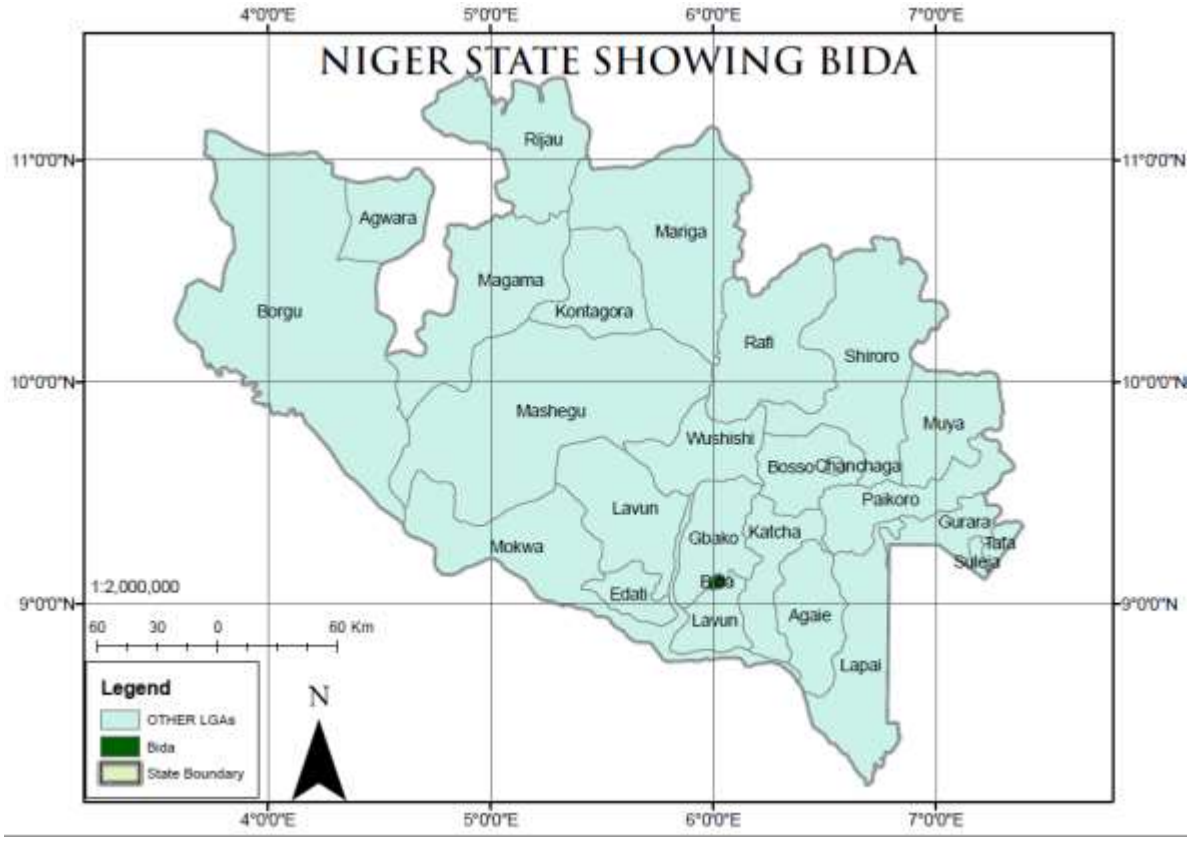
ITEM 29	140.7000	735.274	.000	.868
ITEM 30	140.7000	735.274	.000	.868
ITEM 31	140.2000	703.116	.299	.861
ITEM 32	138.5000	768.368	-.393	.883
ITEM 33	140.4000	704.463	.299	.862
ITEM 34	140.2000	749.326	-.195	.876
ITEM 35	140.4000	703.411	.386	.860
ITEM 36	139.9000	566.200	.685	.830
ITEM 37	139.9000	566.200	.685	.830
ITEM 38	139.9000	566.200	.685	.830
ITEM 39	139.9000	566.200	.685	.830

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
142.7000	835.274	27.11593	39

APPENDIX E

Map of Niger State



APPENDIX F

SPSS BREAKDOWN OF STATISTICAL COMPUTATIONS

Details of Mean responses and standard deviation of Respondents on the level of implementation of occupational health and safety regulations inblock industries.
N1=57,N2=85, Total N=142.

S/N	Items	$\bar{x}_1$	$\bar{x}_2$	$\bar{x}_A$	SD_1	SD_2	SD_A	Decision
1	ITEM 1	1.72	1.57	1.65	0.62	0.54	0.58	Not Implemented
2	ITEM 2	1.72	1.73	1.73	0.65	0.52	0.59	Not Implemented
3	ITEM 3	3.40	1.55	2.48	0.45	0.59	0.52	Not Implemented
4	ITEM 4	3.46	3.31	3.39	0.54	0.49	0.52	Rarely Implemented
5	ITEM 5	1.44	1.71	1.58	0.50	0.63	0.57	Not Implemented
6	ITEM 6	1.61	1.65	1.63	0.53	0.59	0.56	Not Implemented
7	ITEM 7	3.42	3.45	3.44	0.50	0.52	0.51	Rarely Implemented
8	ITEM 8	1.88	1.73	1.81	0.38	0.47	0.43	Not Implemented
9	ITEM 9	1.61	1.58	1.60	0.53	0.52	0.53	Not Implemented
10	ITEM 10	1.75	1.72	1.74	0.47	0.57	0.52	Not Implemented
11	ITEM 11	1.58	1.47	1.53	0.53	0.50	0.52	Not Implemented
12	ITEM 12	3.58	3.40	3.49	0.50	0.56	0.53	Rarely Implemented
13	ITEM 13	3.42	3.48	3.45	0.50	0.57	0.54	Rarely Implemented

***Decision was based on Grand Mean ($\bar{x}_A$) with respect to limit of numbers.**

Details of Mean responses and standard deviation of respondents on the challenges to effective implementation of occupational health and safety regulations in block industries
N1=57,N2=85,Total N=142

S/N	Items	$\bar{x}_1$	$\bar{x}_2$	$\bar{x}_A$	SD_1	SD_2	SD_A	Decision
1	ITEM 1	4.05	3.87	3.96	0.61	0.69	0.65	Agreed
2	ITEM 2	3.60	3.88	3.74	0.65	0.68	0.67	Agreed
3	ITEM 3	4.00	3.91	3.96	0.60	0.65	0.63	Agreed
4	ITEM 4	3.75	3.69	3.72	0.76	0.72	0.74	Agreed
5	ITEM 5	3.58	3.91	3.75	0.65	0.65	0.65	Agreed
6	ITEM 6	4.05	3.75	3.90	0.61	0.63	0.62	Agreed
7	ITEM 7	3.77	3.80	3.79	0.68	0.70	0.69	Agreed
8	ITEM 8	3.75	3.71	3.73	0.71	0.63	0.67	Agreed
9	ITEM 9	3.90	3.87	3.89	0.62	0.72	0.67	Agreed
10	ITEM 10	3.70	3.64	3.67	0.68	0.65	0.67	Agreed
11	ITEM 11	3.88	3.91	3.90	0.63	0.65	0.64	Agreed
12	ITEM 12	3.75	3.92	3.84	0.76	0.68	0.72	Agreed
13	ITEM 13	3.77	3.86	3.82	0.68	0.66	0.67	Agreed

***Decision was based on Grand Mean ($\bar{x}_A$) with respect to limit of numbers.**

Details of Mean responses and standard deviation of respondents on the ways of improving implementation of occupational health and safety regulations in block industries

N1=57,N2=85,Total N=142

S/N	Items	$\bar{x}_1$	$\bar{x}_2$	$\bar{x}_A$	SD_1	SD_2	SD_A	Decision
1	ITEM 1	3.88	3.91	3.90	0.68	0.75	0.72	Agreed
2	ITEM 2	3.75	3.81	3.78	0.69	0.63	0.66	Agreed
3	ITEM 3	4.16	4.12	4.14	0.65	0.61	0.63	Agreed
4	ITEM 4	3.93	4.09	4.01	0.70	0.65	0.68	Agreed
5	ITEM 5	3.91	3.91	3.91	0.61	0.65	0.63	Agreed
6	ITEM 6	4.12	3.93	4.03	0.66	0.72	0.69	Agreed
7	ITEM 7	3.90	3.62	3.76	0.80	0.72	0.76	Agreed
8	ITEM 8	3.90	3.93	3.92	0.62	0.65	0.64	Agreed
9	ITEM 9	4.18	4.12	4.15	0.66	0.61	0.64	Agreed
10	ITEM 10	3.90	3.91	3.91	0.62	0.65	0.64	Agreed
11	ITEM 11	4.02	3.88	3.95	0.67	0.64	0.66	Agreed
12	ITEM 12	3.88	3.91	3.90	0.68	0.75	0.72	Agreed
13	ITEM 13	3.91	4.02	3.97	0.66	0.62	0.64	Agreed

***Decision was based on Grand Mean ($\bar{x}_A$) with respect to limit of numbers.**

RESEARCH QUESTION ONE

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Mgt staff item 1	57	1.00	3.00	1.7193	.61975
Mgt staff item 2	57	1.00	3.00	1.7193	.64792
Mgt staff item 3	57	3.00	4.00	3.4035	.49496
Mgt staff item 4	57	3.00	5.00	3.4561	.53686
Mgt staff item 5	57	1.00	2.00	1.4386	.50063
Mgt staff item 6	57	1.00	3.00	1.6140	.52625
Mgt staff item 7	57	3.00	4.00	3.4211	.49812
Mgt staff item 8	57	1.00	3.00	1.8772	.38127
Mgt staff item 9	57	1.00	3.00	1.6140	.52625
Mgt staff item 10	57	1.00	3.00	1.7544	.47361
Mgt staff item 11	57	1.00	3.00	1.5789	.53276
Mgt staff item 12	57	3.00	4.00	3.5789	.49812
Mgt staff item 13	57	3.00	4.00	3.4211	.49812
Non mgt staff item 1	85	1.00	3.00	1.5647	.54439
Non mgt staff item 2	85	1.00	3.00	1.7294	.52072
Non mgt staff item 3	85	1.00	3.00	1.5529	.58769

Non mgt staff item 4	85	3.00	5.00	3.3059	.48852
Non mgt staff item 5	85	1.00	3.00	1.7059	.63290
Non mgt staff item 6	85	1.00	3.00	1.6471	.59173
Non mgt staff item 7	85	3.00	5.00	3.4471	.52340
Non mgt staff item 8	85	1.00	3.00	1.7294	.47279
Non mgt staff item 9	85	1.00	3.00	1.5765	.52045
Non mgt staff item 10	85	1.00	3.00	1.7176	.56929
Non mgt staff item 11	85	1.00	2.00	1.4706	.50210
Non mgt staff item 12	85	3.00	5.00	3.4000	.56061
Non mgt staff item 13	85	3.00	5.00	3.4824	.56929
Valid N (listwise)	57				

RESEARCH QUESTION TWO

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Mgt staff item 1	57	3.00	5.00	4.0526	.61007
Mgt staff item 2	57	3.00	5.00	3.5965	.65081
Mgt staff item 3	57	3.00	5.00	4.0000	.59761
Mgt staff item 4	57	3.00	5.00	3.7544	.76253
Mgt staff item 5	57	3.00	5.00	3.5789	.65322
Mgt staff item 6	57	3.00	5.00	4.0526	.61007
Mgt staff item 7	57	3.00	5.00	3.7719	.68184
Mgt staff item 8	57	3.00	5.00	3.7544	.71416
Mgt staff item 9	57	3.00	5.00	3.8947	.61772
Mgt staff item 10	57	3.00	5.00	3.7018	.68046
Mgt staff item 11	57	3.00	5.00	3.8772	.62878
Mgt staff item 12	57	3.00	5.00	3.7544	.76253
Mgt staff item 13	57	3.00	5.00	3.7719	.68184
Non mgt staff item 1	85	3.00	5.00	3.8706	.68640
Non mgt staff item 2	85	3.00	5.00	3.8824	.67984
Non mgt staff item 3	85	3.00	5.00	3.9059	.64777
Non mgt staff item 4	85	3.00	5.00	3.6941	.72413
Non mgt staff item 5	85	3.00	5.00	3.9059	.64777
Non mgt staff item 6	85	3.00	5.00	3.7529	.63445
Non mgt staff item 7	85	3.00	5.00	3.8000	.70373
Non mgt staff item 8	85	3.00	5.00	3.7059	.63290
Non mgt staff item 9	85	3.00	5.00	3.8706	.72026
Non mgt staff item 10	85	3.00	5.00	3.6353	.65187
Non mgt staff item 11	85	3.00	5.00	3.9059	.64777
Non mgt staff item 12	85	3.00	5.00	3.9176	.67633

Non mgt staff item 13	85	3.00	5.00	3.8588	.65743
Valid N (listwise)	57				

RESEARCH QUESTION THREE

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Mgt staff item 1	57	3.00	5.00	3.8772	.68322
Mgt staff item 2	57	3.00	5.00	3.7544	.68870
Mgt staff item 3	57	3.00	5.00	4.1579	.64889
Mgt staff item 4	57	3.00	5.00	3.9298	.70355
Mgt staff item 5	57	3.00	5.00	3.9123	.60594
Mgt staff item 6	57	3.00	5.00	4.1228	.65657
Mgt staff item 7	57	3.00	5.00	3.8947	.79472
Mgt staff item 8	57	3.00	5.00	3.8947	.61772
Mgt staff item 9	57	3.00	5.00	4.1754	.65799
Mgt staff item 10	57	3.00	5.00	3.8947	.61772
Mgt staff item 11	57	3.00	5.00	4.0175	.66792
Mgt staff item 12	57	3.00	5.00	3.8772	.68322
Mgt staff item 13	57	3.00	5.00	3.9123	.66227
Non mgt staff item 1	85	3.00	5.00	3.9059	.74998
Non mgt staff item 2	85	3.00	5.00	3.8118	.62667
Non mgt staff item 3	85	3.00	5.00	4.1176	.60576
Non mgt staff item 4	85	3.00	5.00	4.0941	.64777
Non mgt staff item 5	85	3.00	5.00	3.9059	.64777
Non mgt staff item 6	85	3.00	5.00	3.9294	.72026
Non mgt staff item 7	85	3.00	5.00	3.6235	.72336
Non mgt staff item 8	85	3.00	5.00	3.9294	.65079
Non mgt staff item 9	85	3.00	5.00	4.1176	.60576
Non mgt staff item 10	85	3.00	5.00	3.9059	.64777
Non mgt staff item 11	85	3.00	5.00	3.8824	.64387
Non mgt staff item 12	85	3.00	5.00	3.9059	.74998
Non mgt staff item 13	85	3.00	5.00	4.0235	.61676
Valid N (listwise)	57				

HYPOTHESIS ONE (HO1)

[DataSet1] C:\Users\user\Desktop\Peter spss 2nd analysis\2nd Peter z test entered HO1 data.sav

z-Test HO1

Group Statistics

	Respondents grouping	N	Mean	Std. Deviation	Std. Error Mean
Responses	MS	57	2.3536	1.01965	.03746
	NMS	85	2.1792	.98748	.02971

Independent Samples Test

		Levene's Test for Equality of Variances		z-test for Equality of Means						
		F	Sig.	z	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Responses	Equal variances assumed	8.339	.004	3.671	140	.000	.17439	.04751	.08122	.26756
	Equal variances not assumed			3.648	140	.000	.17439	.04781	.08062	.26816

HYPOTHESIS TWO (HO2)

[DataSet1] C:\Users\user\Desktop\Peter spss 2nd analysis\2nd Peter z test entered HO2 data.sav

z-Test HO2

Group Statistics

	Respondents grouping	N	Mean	Std. Deviation	Std. Error Mean
Responses	MS	57	3.8124	.67876	.02493
	NMS	85	3.8235	.67337	.02026

Independent Samples Test

		Levene's Test for Equality of Variances		z-test for Equality of Means						
		F	Sig.	z	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Responses	Equal variances assumed	.328	.567	.346	140	.729	.01111	.03208	.07402	.05179
	Equal variances not assumed			.346	140	.729	.01111	.03213	.07413	.05190

HYPOTHESIS THREE (HO3)

[DataSet1] C:\Users\user\Desktop\Peter spss 2nd analysis\2nd Peter z test entered HO3 data.sav

z-Test HO3

Peter 2nd Verified Z test\2nd Peter HO3 Z test data entered.sav

Group Statistics

	Respondents grouping	N	Mean	Std. Deviation	Std. Error Mean
Responses	MS	57	3.9555	.67537	.02481
	NMS	85	3.9348	.67520	.02031

Independent Samples Test

		Levene's Test for Equality of Variances		z-test for Equality of Means						
		F	Sig.	z	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Responses	Equal variances assumed	.246	.620	.643	140	.520	.02062	.03206	.04226	.08351
	Equal variances not assumed			.643	140	.520	.02062	.03206	.04227	.08352