

**SAFETY PRACTICES NEEDED BY EMPLOYEES OF PAINTING OCCUPATION
FOR SUSTAINABILITY OF BUILDING INDUSTRY IN ABIA STATE**

By

GREGORY MADU OKPARAEKE Ph.D
gokparaeke@gmail.

And

SYLVANUS UMUNAKWE NJOKU Ph.D

Department of Industrial Technical Education,

College of Education

Michael Okpara University of Agriculture Umudike Abia State

Abstract

This study determined the safety practices needed by employees of painting occupation for sustainability of building industry in Abia State. This is with a view to the prevention of accidents in painting occupations in Abia State. The collected data was analyzed with mean and standard deviation. Research question and hypothesis guided the study. The area of the study was Umuahia capital territory Abia State with concentrations on the building industry in Umuahia urban capital city. The population of the study was 78 respondents which consisted of 40 employees of painting and 38 registered builders of the Nigerian Institute of Building Abia state Chapter. Since the population of the study is of manageable size, the seventy eight respondents were used for the study. Therefore, consensus sampling was used. The instrument for data collection was a structured questionnaire comprised of 27 items with five response options rating scale. The validation of the instrument was done by three experts who are building technology lecturers in Imo state University, Owerri. The reliability of the instrument was obtained by single administration of the instrument to 12 registered builders of the Nigerian Institute of Building Imo state Chapter Owerri and 16 employees of painting occupations in Owerri, Imo State. Cronbach Alpha was used to calculate the reliability coefficient of the study. This yielded internal consistency value of .82. The tested hypothesis at $P < 0.05$ level of significance showed that there was no significant differences on the mean rating of the respondents therefore the null hypothesis was up held. Recommendations among others was that painting employees should be exposed to safety practices through training and retraining aimed at prevention of accidents in the building industry.

Keywords: Safety Practices, Employees, Painting occupation, Sustainability, Building Industry

Introduction

To the non professionals or novice of the building industry painting function is just covering and the pigmentation of surfaces of structures for pleasant appearances. Unknown to many, painting plays vital roles in the structural requirement of buildings responsible for the survival and durability of the building structures by contributing to the strength, stability deformation, non absorption of moisture and impermeability (Okparaeké 2019). Painting is the application of coating of materials in a liquid or plastic condition to surfaces (Ndineze 2014) Painting is a very unique form of arts which pigments are used to create colours with other substances as vehicles such as oil, water thinners and others to cover surfaces (Pradhan, 2023).

Motor vehicles, buildings, air crafts, ships, equipment of wares and many other industrial use paints (Pradhan 2023). Currently, paint manufacturers produce ready mixed paint based on specifications supply or market various types of paints to the users (Ndineze, 2014). With rapid developments in the building industry many types and brands of paints have been produced for various purposes. Paints are composed of such ingredients like bases which are solid substances in fine state of division that form the bulk, determine the character and impart durability. It reduces shrinkage cracks and inhibits corrosion. The bases include white lead and red lead for lead paints. Oxide of zinc or zinc white form base of all zinc paints. It is smooth, transparent and non poisonous. It is not durable and it is difficult to work with. Oxide of iron form base for all iron paints. The tint varies from yellowish brown to black and prevents the rusting of iron surfaces. Titanium white has intense opacity, non poisonous, provides transparent film use for receiving coat of enamel. Aluminum powder used for aluminum paint that keeps moisture content of wood practically the same it prevent cracking and warping of wood. Lithophone is mixture of zinc sulphide and barites. Similar in look to oxide of zinc. It is cheap and easily applied but changes colour when exposed to day light and therefore made for interior use.

Vehicle is liquid substance which holds the ingredients of the paint together and enables the paint to spread on the surface as thin layer and serve as binder of paint particles. Paint vehicles include linseed oil of various types, stain oil, tung oil, linseed oil, nut oil and others. Driers are substances that fasten drying processes of paint. Driers may be soluble driers or paste drier of compound of metals like cobalt, lead, manganese. From the above ingredients many paint types are produced for use such as aluminum, text coat emulsion paints, water paints, distempers.

solvent oil, hard gloss enamel, synthetic resin paints others are plastics, luminous, bituminous, anticorrosive, asbestos, graphite paints and many others.

The above paint types could be associated with defects such as crazing and cracking, chalking bleeding, sulphiding, winking, blustering and peeling, blooming these defects which occur during paints storage, mixing, application, curing and usage of the painted structures had always mare the quantity and quality of the paints and paintings.

The methods of paints applications include brushing, spraying, dipping and rolling involves the use of emulsion paint mixed with water to make it workable for external walls, rooms, ceilings facia board. The gloss paint mix with kerosene is applied on wooden, iron and metal surfaces like doors, windows, protectors, balustrades. It is equally used for external walls and the foot of walls. The text coat which comes in powdered form can be mixed with water paint or water. It is mainly for walls and ceiling especially external walls (Ndineze, 2014).

The responsibilities of painting of surfaces for enhanced appearances, strengths and stabilities of structures in the building industry had remained those of the employees of the painting occupation. Employees of painting occupation could be said to be very vital in building finishing and up grading of surfaces of structures in the environments. Worldskills (2023) describes employees of painting occupation as painters and decorators who work in public with the responsibilities of external and internal appearances of buildings and the protection from water, rust, mould, insects and weather. There is direct relationship between the nature and quality of service required by the clients since the painters serve as links/intermediary between the paint manufacturers, paint distributors, paint transporters, paint marketers and the client who are the consumers of paint products. Therefore, the painting employees have the responsibility to work professionally and interactively with the clients and other stakeholders to ensure business growth, give satisfaction to all and maintain relationship with other parts of the construction industry to enable the painters work internally and externally in such diverse environment of companies, factories, schools, hotels, hospitals, the homes of clients and on building sites in all weather conditions.

Worldskills (2023) added that the painting employees should offer range of services, including interpreting client requirement / drawings, advising on designs/colour specifications, painting, spraying decorative coatings, wall papering gilding and sign writing to high standard. Others are work organization, self management, communication interpersonal skills, problem solving,

innovation, creativity, and the ability to prepare surfaces thoroughly with meticulous care and work accurately are the universal attributes of the outstanding painting occupations. Worldskills (2023) concluded that in mobile labour market the painter and decorator may work in teams or alone or in both whatever the structure of work, the trained and experienced finisher takes on high level of personal responsibility and autonomy by carefully determining the requirement of client, working safely and tidily, exceptional planning, scheduling, precision and attention to detail to the fine gilding of objects and finishing of structures, every process matters, However, mistakes are largely irreversible and costly. With the global technological development many commercial and international opportunities await talented painters and decorators who can reputedly work with diverse cultures, trends and fashions.

As the employees of the painting occupation carry out the finishing works, with paints of toxic chemicals, painting tools and equipment internally and externally in all weathers, they are subjected to hazards and fatal accidents. Accident, according to Okparaeke and Okonkwo (2016) is an unsafe, unplanned and uncontrollable occurrences in which the actions of objects, substances, persons, weather or other creatures end up to unpleasant development that could lead to disorganization of the system, stoppage of production activities or even resource wastage. This could result to loss of time, human, material or financial resources with other unforeseen or unpredictable circumstances.

Accidents in all the occupations in the building industry had remained very risky with high frequencies of occurrences with crippling devastation. The painting occupation ranks among the highest in terms of unpleasant accident occurrences in the building industry (Pradhan 2023).

Accidents do not just happen, rather they are caused. The main causes of accidents include unsafe acts of employees and unsafe environment. Painting employees will work without personnel protective devices, use painting materials, tools and equipment wrongly. The finishes applied on surfaces may not mature for use due to bad weather to cause falls thereby turning to environmental factors that cause accidents. Forms of accidents common in painting industry include hazards from paints and painting. According to Pradhan (2023), handling painting materials involve some amount of risks. Many compounds use in paints contain high amount of toxic elements such as lead and others that can be lethal to human beings animal and other creatures if not handled cautiously most substances used with pigments for painting are organic in nature. However solvents like turpentine, mineral, spirits, citrus- based thinners, alkyds,

based mediums, resins and others which serve specific purposes contain harm chemicals. Besides, pigments also contain toxic elements which if mishandled spells disaster to the environment, Pradhan (2023) concluded.

Fall from height, painting employees fall from upper floors, ladder, roofs, scaffolds or hoisting equipment. Other forms of accidents include inhaling vapours, fumes, lead, cement dust, asbestos dust, corrosive liquids, paint dust and other dangerous chemicals. Absorbing paints and other chemicals into the body, noise pollution, injuries from hand tool/ painting equipment, paint droplets penetrating into the eyes and fire out break. The effects of accidents to painting occupation are enormous, studies had indicated that accidents in painting occupation and other construction industry occupations had always resulted to injuries such as incapacitation, paralyses, eye problem/ blindness, heart attack, kidney problem, stroke and others), death, damages to tools equipment collapse of structures (towers, scaffolds, ladders and building structures), wastage of paints and other painting materials. Other effects are projects delay or abandonment and lost of skilled painters to other safer occupation such as businesses, electronics, computer engineering/soft wares, motor mechanics. Also dependent relation of victims, client, construction industry, government and the society suffers social economic deprivations,, irreparable loses, brain drain, bankruptcy and liquidation of construction firms (Okparaeke & Okonkwo 2016). This study on safety practices needed by employees of painting and decorating occupation for sustainability of build environment in the building in Abia State therefore becomes imperative.

Statement of problem

As a result of the nature of painting occupation, employees are subjected regularly to kneeling, bending, reaching, lifting, climbing and others. The above painting activities or processes which are tedious have always led to chronic injuries such as back/ neck and general body pains, posture distortions, deformities that had ended up to incapacitations, injuries, deaths, lost of income or means of livelihood. This study therefore is to proffer safety practices needed by employees of painting occupation for the sustainability of built environment for safer building industry in Abia state.

Purpose of the Study

The purpose of the study determined the safety practices needed by employees of painting occupation for sustainability of built environment for safer building industry in Abia State. This is with a view to curtailing or controlling occurrence of accidents in painting occupations to sustain safety in the construction industry in Abia State?

Research Question

What are the safety practices needed by employees of painting occupation for sustainability of built environment for safer building industry in Abia State.

Null Hypothesis

H₀: There is no significant difference in the mean rating of the responses of paint employees and registered builders in Abia State.

Methodology

Survey research design was used for this study. According to Nwagu in Okparaeké (2013) a descriptive survey research design collects data from well defined population or systematically selected segment of the population for the purpose of determining and identifying the attributes and the characteristics of the population of the study. The area of the study is Umuahia capital territory Abia State with concentrations on the building industry in Umuahia urban capital city. The population of the study is 78 respondents which consisted of 40 employees of painting and 38 registered builders of the Nigerian Institute Building Abia state Chapter. Since the population of the study is of manageable size, the seventy eight respondents were used for the study. Therefore, consensus sampling was used. The instrument for data collection was a structured questionnaire comprising of 27 items with five response options rating scale of Safety Practices Highly Needed:(SPHN) =5, Safety Practices Needed:(SPN) = 4, Safety Practices Moderately Needed:(SPMN) = 3, Safety Practices Needed:(SPNN) ()=2, Safety Practices Highly Not Needed:(SPHNN) = 1 were used for this study. The validation of the instrument was done by three experts who are building technology lecturers in Imo State University, Owerri. Their suggestions were used to modify and improve the instrument before it was administered to the respondents. The reliability of the instrument was obtained by single administration of the instrument to 12 registered builders of the Nigerian Institute of Building Imo state Chapter Owerri and 16 employees of painting occupations in Owerri Imo State. Cronbach Alpha was used to calculate the reliability coefficient of the study. This yielded

internal consistency value of .82. The instrument was administered to 78 respondents with the help of three research assistants. All the questionnaire administered representing 100% were collected back and used for the study.

Data Analysis

The data was analyzed with mean and standard deviation to answer the research question. To test the hypothesis, z-test at $p < 0.05$ levels of significance was used. The tested hypothesis with the calculated value less than the table value showed null hypothesis H_0 which indicated that there is no significant difference between the mean ratings of two groups of respondents on safety practices needed by employees of painting occupation for sustainability of the environment for safer building industry in Abia State.

Table1:

Descriptive analysis of data of safety practices needed by employees of painting occupation for sustainability of built environment for safer building industry in Abia State.

Research Question

What are the safety practices needed by employees of painting occupation for sustainability of built environment for safer building industry in Abia State?

N=78							
S/N	safety practices needed by employees of painting occupation	\bar{X}	SD	z-cal value	z- tab value	Df	Remark
1	Protecting the eyes from harmful chemical with safety goggle during painting.	3.6	0.9	1.9	2.8	76	SPN
2	Protecting the head from paint splash and falling objects with hard hat when painting.	3.7	1.0	2.5	2.8	76	SPN
3	Covering the mouth and nose with face mask to prevent inhaling of paint chemicals or dust.	4.0	1.2	2.4	2.8	76	SPN
4	Using cloths or apparels with full sleeve shirt and long pants (trousers) for painting to prevent the body absorbing paint or getting in touch with toxic element.	3.8	1.1	2.6	2.8	76	SPN
5	Using cloths or apparels with full sleeve shirt and long pants (trousers) for painting to prevent the body absorbing paint or getting in touch with toxic element.	3.6	1.5	1.8	2.8	76	SPN

6	Eat before and after painting and body cleaning to avoid eating paint that could cause health hazards.	3.2	1.3	2.0	2.8	76	SPN
7	Applying good quality sanitizer to purify the body after painting and body cleaning.	3.9	0.9	2.7	2.8	76	SPN
8	Using the right painting tools strictly for the designed painting work to prevent implement abuse or was use	4.1	1.5	2.6	2.8	76	SPN
9	Avoiding the licking of paint brush when testing viscosity of paint to avoid contamination from toxic element contained in the pigment or solvents	3.7	1.2	2.3	2.8	76	SPN
10	Washing hand thoroughly and change of cloths for painting it break time and eating becomes necessary during painting.	3.5	1.4	2.2	2.8	76	SPN
11	Ventilating all painting places such as rooms or structures during painting / spraying work to avoid breathing of furnace toxic chemicals	3.6	1.0	2.6	2.8	76	SPN
12	Placing clothing or rags on the floors during the painting of internals of structures.	3.8	1.3	2.0	2.8	76	SPN
13	Washing paint cloths separately to prevent contamination of non painting cloths.	4.0	1.5	2.4	2.8	76	SPN
14	Avoiding the washings of painting cloths with cloths washing machines to prevent the cont/animation with toxic elements.	3.7	1.2	2.6	2.8	76	SPN
15	Desisting from removal of old paints from surfaces through sand papering to avoid harmful effects of breathing toxic paint dust.	3.7	1.1	2.1	2.8	76	SPN
16	Hanging rags and cloths use for painting out doors and out of the reach of children till the complete evaporation of solvents and other paint substances.	3.9	1.1	2.5	2.8	76	SPN
17	Dispose paint cans and solvent draped materials at out door places,out of the reach of children, after thorough ventilation and according to disposal procedures / regulations	3.9	1.3	2.6	2.8	76	SPN
18	Clean sinks or wash hand basins properly. After use for washing of painting implement and other painting accessories to avoid poisoning by toxic chemical	4.1	1.4	1.9	2.8	76	SPN

19	Covering / spiled at paint with sand and appropriate controls to avoid destruction of wild live, farm land, contain nation of water course, killing of acquatitives and environmental degradation.	3.7	1.2	2.4	2.8	76	SPN
20	Effective use of step: combined or extension ladders for painting work should be placed on hand base, supported at the bottom and tied with marine rope at the top.	3.8	1.3	2.0	2.8	76	SPN
21	Using tower, dependent or independent scaffolds on stable base which the erection, usage and dismantling is done by adequate supervision, and accordance building regulation.	3.6	0.9	2.3	2.8	76	SPN
22	Avoiding explosion or fire out break by not storing paints, thinners or solvents enclosure with electrical installations or make fire. Using safety nets to save human beings equipment and materials fall off height, stories or high rise buildings from injuries, deaths, or damages.	3.9	1.3	2.5	2.8	76	SPN
23	Desisting from spraying indoors without extractors, smoking or allowing naked light.	3.6	1.2	2.4	2.8	76	SPN
24	Painting with cranes, hoisting and lifting equipment should be operational with proper installation on formed bases, efficient experienced operators, strict supervision and regular maintenance.	3.8	1.4	2.1	2.8	76	SPN
25	Making available for use fire extinguishers, sand buckets and bucket of water for collection of burning stripped paint particles when stripping painted surfaces with blow lamps or blow torches and scrapper for fire containment in case of outbreak	3.6	1.5	2.2	2.8	76	SPN
26	Ensuring that accidental contacts with pressurized sprayed paint with the body or skin seek medical attentions Desisting from eating during painting operations to avoid eating food contaminated by toxic paint chemicals	3.5	1.3	2.4	2.8	76	SPN
27	Avoiding drinking of water during painting operations to prevent drinking water contaminated by toxic chemicals.	3.3	1.1	2.5	2.8	76	SPN

Key – X – mean, SD – Standard Deviation, z-cal value - z- calculated value, z – tab – z – table value, N- Number of Respondents, SPN - Safety Practices Needed:-SPNN- Safety Practices Not Needed

The result of the table showed mean range of 3.5 to 4.2. This mean range is above the minimum 3.50 agreed on as safety practices needed by employees of painting occupation for sustainability of built environment for safer building industry in Abia State.. The table equally indicated the standard deviation range of 0.9-1.3. This range showed uniformity in the responses of the respondents and that the mean is not far from each other. The outcome of the hypothesis tested at $p < 0.05$ level of significance at the degree of freedom of 2 and 76 indicated that all the z-calculated -value is lower than the z-table value. This showed that there was no significant difference in the mean ratings of the respondents on the safety practices needed by employees of painting occupation for sustainability of built environment for safer building industry in Abia State.

Result and Discussion

The employees of the painting occupation needed the following: -

1. Safety practices in the uses of paints and painting materials during painting operations.
2. Safety practices in the uses of painting tools and equipment during painting operations and finishing
3. Safety practices before, during, and after painting operations and finishing

Discussion of findings

The result of the study shows that all the items indicated competencies as fundamental to safety in every occupation, safety protective equipment, tool skills safety, proper uses of high-profile painting equipment especially internal and external equipment for stories and high rise building and the handling and using hazardous painting materials will serve as safety practices needed by painting employees in Abia state. The above out comes corresponded with studies by expert from the construction industry. Carrel (1990) stated that the most important ingredient is mastery of skills in every occupation which promotes safety consciousness, skills in use r manipulation of the implements (tools and equipment) knowledge of products or out puts and competencies in carrying out painting operations. Carrel added that the employees of painting should check and double check the equipment before and after uses. Read product labels carefully. Invest and use correctly safety goggles, tough work rubber gloves, sturdy cloths and a hard hat. Keep first aid kit handy in the work site utility room work vehicle. Rangwala and Rangwala (2010) call for cautions in the handling, application of paints and painting materials,

cleaning of painting implements to prevent poisoning of persons animals or environmental degradation.

Conclusion

In the construction industry, structures not subjected to finishing will be regarded as uncompleted. And paint and painting which had always facilitated the completing of structure if undone will make such structures not to meet these structural requirement like protection from weather, strength stability stoppage of absorption and permeability of moisture, protection from chemical attack and above all improvement of appearances. This is in addition to preventing the employees of painting occupation deserting their occupation to other safer occupation. Therefore study on safety practices needed by employees of painting occupation for sustainability of built environment from safer building industry in Abia state becomes worthwhile venture.

Recommendations.

- Painting employees should be exposed to safety practices through training and retraining.
- Painting employees should be provided with safety protective equipment
- Painting operations should be carried out under strict supervision
- plaintive works at elevated heights should be carried out with such equipment like ladder, steps, scaffolds and safety nets under supervision.
- Inhabitants of painting environment should be protected from chemical pollutions and counter insinuations.

References

- Carrell A.I. (1990). *Best home hints from the super handyman*. Texax: Taylor Publishing company.
- Ndineze, F. N. (2014). *Building finishing and concrete technology and practices*. Owerri: Lord Dubem publishers.
- Okparaeké, G.M. (2019) *pragmatical technical, building and mechanical drawing with computer application for colleges and universities*. Owerri shacks publishers Nigeria.
- Pradhan, R (2023). *what safety practices should you consider before oil painting at home?*

<https://www.linkedin.com/pulse>: Retrieved 10/10/2023.

Okparaeké, G. M. & Okonkwo, M. O. (2016.) Safety practice skills required by building construction employees in the use of metals in buildings: *Journal of Educational foundation university of Nigeria Nsukka* .6(-) 25- 35

Okparaeké, G. M. & Okonkwo, M.O. (2014).Safety practice skills required by metal work employees in the use of metals in building. *Review of education. Institute of Education Journal University of Nigeria Nsukka*. 25(2) 164 – 175.

World skills (2023) www.worldskills.org. Org Retrived 20/9/2023.