SAFETY PRACTICES OF INDUSTRIES IN THREE AREAS OF SPECIALTIES IN TECHNICAL EDUCATION

Abidemi O. Shodeinde
Department of Technical Education, Tai Solarin University of Education, Ijagun
contactabidemi@gmail.com

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Odumuyiwa A. Odumosu
Department of Technical Education, Tai Solarin University of Education, Ijagun

Abstract
This study appraised the safety practices of industries in the three out of the six major areas of Technical Education, which span across building, mechanical, and electrical technology industries. Two research questions and two null hypotheses, tested at 0.05 level of significance guided the study. A 15-item questionnaire, meant to ascertain the safety practices in the workplace was administered to 30 factory workers in the three industries in three areas of technical education. The instrument which was validated by experts, yielded a reliability coefficient of 0.87. Mean was used to analyze data to answer the research questions, while Analysis of Variance (ANOVA) was employed to test the hypotheses. Findings showed that the prevalence of accident in industries is not because of absence of safety equipment, but a combination of careless attitude of workers, and employers' failure to enforce compliance to safety rules. The study also revealed that safety practices in an industry does not depend on the type of work it engages in. The findings have implications for technical education practitioners. Amongst others, it was recommended that industries should provide adequate measures to safeguard the health of workers.
Keywords: Safety Practices, Industries, Technical Education

Introduction

Historically, Vocational and Technical Education has been a means of preparing workforce for industries and a means to improve the formation of human capital, increase productivity and employment. Vocational and technical education is defined in the National policy on Education as a comprehensive term, referring to those aspect of educational process, involving in addition to general education, the study of technologies and related sciences and acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economics and social life (Federal Republic of Nigeria, 2013). It further explains Vocational and Technical Education to be a means of preparing for occupational field and for effective participation in the world of work. One of the goals of the policy concerning

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Technical Education is to provide trained manpower in applied science, technology and technical levels that will make use of skills necessary in industries for agricultural, commercial and economic development.

The practical instructions given to those who are going to be employed in commerce and industries or allied type of enterprise using tools and machinery, for the purpose of production, preservation and distribution of goods and services is known as Technical Education. Oyenuga (2003) noted that Technical Education is a discipline that trains the manpower needed in production section of industries, and works as an agent that turns technology into what plays a highly important role in our society. Technical Education is offered in the Colleges of Education, some Polytechnics, and Universities. Although it is classified into different areas of specializations, this study focuses on the common areas of specialization for the purpose of giving distinctions and focus into various occupational areas that learners can venture into. The three areas are building/woodwork technology, electrical/electronic technology, and automobile/metalwork technology. Learners who go through the Technical Education programme can either demonstrate the skills they acquired in relevant industries as employees, or choose to be self-employed, thereby contributing their quota to the socio-economic development of the country.

Due to industrialization, many industries have emerged with sophisticated working equipment, and the use of harmful substances for production (Taiwo, 2005). This development has led to incessant cases of accident in the industrial establishments. According to Falae, cited in Fagbemi (1997), it is highly improbable that any family exist in Nigeria which has not experienced the anguish of the sudden loss of a beloved one as a result of accident that could have been avoided. Workplace accident statistics in Table 1 below shows that people experience more physical problems at work.

Table 1
Accident Statistics

Workplace Accident	**Statistics**
Deaths occurring from occupational accidents and work-related diseases across the globe yearly	2.2 Million
Occupational accidents	270 Million
Work related disease incidents	160 Million
Deaths from workplace accidents	350,000
Deaths from workplace diseases	1.7 Million

Source: International Labour Organization Factsheet, (2012)

Accidents cost millions of lost man-hours of production each year, but this is a mild problem when compared with the immeasurable cost of human suffering. Victims of industrial accident may be blinded, maimed for life, or confined to hospital

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bed for months or even death. According to Safety Management Services (2002), accidents do not just happen; they are caused by unsafe acts of people and unsafe conditions. One cannot think of a single accident that could not have been prevented by care and forethought on somebody's parts. Kadiri (2006) observed that safety is often not recognized in the top of priorities when it comes to building and managing industries. Thousands of accidents occur in the engineering environment every day and so many lives have been lost or rendered useless due to this occurrence (Taiwo, 2005).

Another statistics gathered by Safety Management Services (2002) show that of every three accident which occur, two are caused by the personal element of the victim, and one by every means beyond the individual's control. Accident is mostly caused by unsafe acts such as horseplay, untidiness, overconfidence, thoughtlessness, forgetfulness, inattentiveness, and unsafe condition in the working environment, which increase the employees' chances of having accident (Gadds & Collins, 2002). US Department of Labour (2009) also revealed that unsafe acts of people account for approximately 80% of all accidents while unsafe conditions account for about 20%.

Kadiri (2006) explained that some employers assume little responsibility for the protection of worker's health and safety. Some do not even know that they have moral and legal responsibility to protect their workers. Generally, lack of attention to safety practices such as using prescribed safety equipment, turning off equipment after work, provision of medical and first aid facilities among others, undoubtedly creates inherent unsafe situations in the process that leads to disastrous accidents. Workers have a fundamental right to life, their families and dependants also do not have to suffer anguish due to loss of their own. Also, employers do not need to use what ought to be the profits from their employment or investment from other sources in settling victims families as compensation for accidents.

It is a basic human right to return home from work in good health. Workers deserve a safe workplace, an environment where their wellbeing-- physical, mental and social is promoted and maintained to the highest degree. Good safety practices will reduce materials wastage, increase productivity, save money that will otherwise be spent on personnel injury or death, claims, legal fees and government penalties; which can exact heavy toll on company's resources. The nation at large will also benefit because the success of industries will consequently impact the economy positively. In the light of these, safety practices of industries in industrial establishments were investigated.

Research Questions

The following research questions guided the study:

1. What is the level of adequacy of safety measures in the selected industrial establishments?
2. What is the attitude of workers to safety measures in the selected industrial establishments?

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Hypotheses

The following null hypotheses were tested at 0.05 level of significance

1. There is no significance mean difference in the responses of workers in the three industries on the adequacy of safety measures.
2. There is no significance mean difference in the responses of workers in the three industries on their attitude to safety rules.

Methodology

This research was a survey research design to appraise the safety practices of selected industrial establishments in relation to the areas of Technical Education. According to Olaitan and Nwoke (2004), a survey research is one in which the entire population or representative sample is studied by collecting and analyzing data from the group through the use of questionnaire. Survey research was considered suitable because the study sought for information from the workers in the three industries with the aid of questionnaires. The study was carried out in Ogun State, Nigeria. Three industries were purposively selected, each from the building, mechanical and electrical industry, to represent industries in the three out of the different major areas of Technical Education. The population for the study consists of 97 factory workers in these industries. Non-proportionate stratified random sampling was used to select 10 workers randomly from each of the three industries, making a total number of 30 respondents. A structured questionnaire was used for data collection. The questionnaire was subjected to face validation by three technical education experts while the reliability of the instrument was established using Cronbach's alpha (α) formula and it yielded a reliability coefficient of 0.87. Mean was used to analyze the data to answer the research questions. Nominal values were assigned to different scaling items of the questionnaire and corresponding mean scores were interpreted using real limit of numbers. Concerning the limit for agreement or rejection, any item statement that had a mean score of 3.50 and above was regarded as Strongly Agreed, 2.50-3.49 as agreed, 1.50-2.49 as Disagreed, and 0.50-1.49 as Strongly Disagreed. aLSO, Analysis of Variance (ANOVA) was employed to test the hypotheses at 0.05 level of significance. The null hypothesis was upheld when the probability (p) value is greater than, or equal to the preset alpha level (0.05), and otherwise rejected. (i.e. Significant at $p < 0.05$, Not significant at $p \geq 0.05$).

Results

The results for the study were obtained from the research questions answered and hypotheses tested.

Research Question 1: What is the level of adequacy of safety measures in the selected industrial establishments?

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Table 2
Means of respondents on the safety measures put in place in the three industries

S/N	Item Description	Mechanical Industry		Woodwork Industry		Electrical Industry	
		$\bar{X}$	Remark	$\bar{X}$	Remark	$\bar{X}$	Remark
1	The company trains workers to be safety conscious	3.28	Agree	3.38	Agree	3.35	Agree
2	The company provide first aid facilities	3.36	Agree	3.23	Agree	3.38	Agree
3	The company provide proper lighting in the workshop	3.47	Agree	3.35	Agree	3.32	Agree
4	The company ensure physical comfort of workers	3.35	Agree	3.32	Agree	3.33	Agree
5	There is adequate information on the use of harmful substance	3.47	Agree	3.35	Agree	3.49	Agree
6	The company respond to all accident and injuries in times	3.35	Agree	3.25	Agree	3.39	Agree
7	The company enforce safety rules	3.38	Agree	3.33	Agree	2.25	Disagree
8	There is adequate ventilation in the workshop	3.35	Agree	2.45	Disagree	2.68	Agree

Eight questionnaires items were used to elicit the opinion of workers on the level of adequacy of safety measures available in the industries. The data in Table 2 shows that all the workers in the three industries were almost of the same opinion on the provision of safety measures in their workplace. However, workers in the electrical industry pointed out that compliance to safety rules are not enforced in their industry. In the same vein, workers in the woodwork section complained of poor ventilation of their workshop. Workers in the three industries agreed on the adequacy of all other safety measures in their workplace.

Research Question 2: What is the attitude of workers to safety measures in the selected industrial establishments?

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Table 3
Attitude of workers to the safety measures

		Mechanical Industry		Woodwork Industry		Electrical Industry	
S/N	**Item Description**	**$\bar{X}$**	**Remark**	**$\bar{X}$**	**Remark**	**$\bar{X}$**	**Remark**
9	Workers use safety equipment provided by the company.	3.35	Agree	3.39	Agree	3.27	Agree
10	Workers promptly report any faulty equipment	3.38	Agree	3.35	Agree	3.44	Agree
11	Workers compulsory use safety equipment	2.32	Disagree	2.33	Disagree	3.14	Agree
12	Workers participate in rough play in the workshop	3.33	Agree	3.38	Agree	3.25	Agree
13	Workers follow instructions attached to materials and equipment	3.49	Agree	3.30	Agree	3.22	Agree
14	Workers consider the welfare of others at work	3.39	Agree	3.27	Agree	3.37	Agree
15	Workers obey safety rules	3.25	Agree	3.43	Agree	3.33	Agree

Table 3 above reveals that workers in the three industries agree to their compliance to the safety rules laid down in their workplace, with the exception of workers in mechanical and woodwork industries, who believed that obedience to safety rules is not compulsory.

Hypothesis 1: There is no significant mean difference in the response of workers in the three industries on the adequacy of safety measures.

Table 4
Analysis of Variance (ANOVA) of the responses of workers in the three industries on the adequacy of safety measures

Variation Sources	Sum of Squares	df	Mean Squares	F	Sig.	Remark
Between Groups	0.247	2	1.12	0.027	.035	NS
Within Groups	122.5	27	3.54			
Total	155.48	29				

The results presented in table 4 revealed no significant (NS) difference in the mean responses of workers in the three industries on the adequacy of safety measures, ($F=0.03$, $p>0.05$). Therefore, the null hypothesis was not rejected at 0.05 level of significance.

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Hypothesis 2: There is no significant mean difference in the responses of workers in the three industries on compliance with safety rules.

Table 5
Analysis of Variance (ANOVA) on the responses of workers in the three industries on compliance with safety rules

Variation Sources	Sum of Squares	df	Mean Squares	F	Sig.	Remark
Between Groups	0.19	2	1.10	0.042	.027	NS
Within Groups	60.8	27	3.23			
Total	60.99	29				

The results presented in table 5 revealed no significant (NS) difference in the mean responses of workers in the three industries on their compliance to safety rules, ($F=0.04$, $p>0.05$). Therefore, the null hypothesis was not rejected at 0.05 level of significance.

Summary of Findings

The following are summary of the findings:

1. Few industry workers, even after providing safety measures and equipment, failed to enforce the safety rules among their workers.
2. Few industries actually failed to provide adequate safety measures for their workers. An example is that of the woodworking industry that was not well ventilated.
3. Workers claim to be adherent to safety rules.
4. Safety practices are not determined by the type of work an industry engages in. This is because, there was no significant difference in the responses of workers in the three industries on the level of adequacy of safety measures and compliance to safety rules.

Discussion of Findings

Findings revealed that some industries, even after providing safety measures and equipment, failed to enforce the safety rules among their workers. This posture may appeal to the attitude of indiscipline, disobedience, and lack of self-control in some workers; which could make them disregard the use of safety kits and equipment. This will expose the workers and the employers to the undesirable effects of workplace accidents. This finding is in line with the report of US Department of Labour (2009) that employees often fail to enforce the Occupational Health and Safety (OSHA) standards. McCornick and Sander (1993), further noted that a good safety skill programme together with built-in compliance in proper tool, equipment, and material usage, can often reduce the incidence of injuries, material wastage and cumulative effect traumas.

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Findings also revealed that some industries actually failed to provide adequate safety measures for their workers. An example is that of woodworking industry that was not well ventilated. This is in consonance with the observation of Kleiman and Turner (2006), that despite laws designed to ensure safety in the workplace, accident rates in companies are alarmingly high due to equipment insufficiency, use of inappropriate equipment, safety devices being removed or inoperative, and the lack of such thing as engineering controls, respiratory protection, and protective clothing.

From this study, it was also found that some workers believe it is not compulsory to use safety equipment. Workers nonchalant attitude may probably be because accidents do not occur frequently in the workplace. This is in line with the paraphrased account in the Amplified Bible (1987), in the book of Ecclesiastes 8:11 that because the sentence of foolish living is not speedily executed, men's heart are fully set to continue in it.

Furthermore, based on the findings of the study, safety practices are not determined by the type of work an industry engages in. This is because, there was no significance difference in the responses of workers in the three industries on the adequacy of safety measures and compliance to safety rules. This is line with the findings of Gadds and Collin (2002) that safety culture in an organization is a product of individual and group values, attitudes, perceptions, competencies, patterns of behavior, and this determines the commitment to an organization's health and safety management. Safety practices in an organization is dependent on more complex factors, as exemplified above, rather than the type of work the industry engages in.

Conclusion

Based on the result of this study, it is concluded that safety practices are inevitably essential for workers in the industrial establishments that are related to the major areas of Technical Education. This study also concludes that accident in industries is not majorly because of absence of safety equipment, but failure to ensure compliance of workers by the employers. Thence, accident should be avoided in the school workshop of the areas of specialties in Technical Education.

Recommendations

The following recommendations are suggested based on the findings of the study.

1. Industries should provide adequate measures to safeguard the health of their workers; they should comply with national requirements on factory operations. This is for the benefit of their workers and their business profitability.
2. Employers should devise a strategy of monitoring compliance with safety rules. This is important in order to change the safety culture of their employees.

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3. Workers should frequently be reminded of the need to safeguard their lives by observing safety rules at all times. Current reports of worldwide workplace casualties should be made available to workers.

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