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CAUSATIVE FACTORS FOR INCESSANT ACCIDENT OCCURRENCES IN TECHNICAL COLLEGE WORKSHOPS IN KWARA AND KOGI STATES

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ABSTRACT

This study investigated the causative factors of accidents in technical college workshops in Kwara and Kogi States. Two research questions were posed for the study. A descriptive research design was employed. The area of the study was Kwara and Kogi states. A total of 397 technical teachers made up the population of the study. There was no sampling. A 39 items questionnaire named 'Questionnaire on Causative Factors of Accidents in Technical College Workshops (QCFATCW)'. Three experts validated the instrument and a reliability test using Cronbach Alpha method yielded 0.92. Mean rating was used to analyze data to answer the research questions. The findings among others revealed that causes of accidents included failure to adhere to safety rules and regulations; using defective tools; engaging in horse play and poor housing keeping. Based on the findings, recommendations were made among which were that technical teachers should organize the workshop activities with good housekeeping and that government should ensure availability of training equipment in adequate quantity and quality to commensurate with students' ratio in technical college workshops.

Keywords: Causative factors, accidents, technical, workshops.

Introduction

The utilization of workshop facilities like tools, equipment, safety devices, consumable and non-consumable materials are of paramount importance for effective teaching and learning especially in technical and vocational education for the development of practical skills of the students. Nwankwo (2011) affirmed that the availability of various machine tools and even the most up-to-date ones, in sufficient quantities does not itself ensure efficient and highly productive operation of an industrial enterprise without the appropriate use of those machine tools and equipment. Technical teachers consist of trained teachers in different areas of technology education programmes such as electrical/electronic, building, woodwork, plumbing, carpentry and joinery, auto mechanics and metalwork. They are responsible for imparting appropriate knowledge, skills, and attitudes to the learners within the instructional system as may be applied to the world of work. For anybody to assume the duty of a technical teacher, such a person is expected to possess the needed competencies for imparting technical knowledge and skills, especially when a desirable emphasis is on competency-based learning (Davies, 2001). According to Ekpenyong (2008), technical teachers must be versatile in their areas of specialization and in science education courses as well as in workshop organization and management. Technical teachers transmit the relevant practical skills by demonstrating before the students the tasks to be performed, while the students in turn are expected to acquire the

skills by practising the skills in a workshop as soon as the demonstration is over.

A workshop is an essential facility for the study and practice of technical and vocational education. Umunadi (2010) indicated that technical college workshops should have the same equipment, tools and materials in terms of types, designs, and specifications with the industry where the students will eventually work after training. Workshops are expected to be equipped with a variety of tools and machines that range from simple hand-operated machines to complex computer-controlled machines capable of great precision for teaching and learning processes. Technical college equipment includes lathe machines, shaping machines, rolling machines, drilling machines, cutting machines, welding machines, circular saw, guillotine and various hand tools such as hacksaws, files, pincers, pliers, drills, soldering iron, and spanners that are required for imparting practical knowledge and skills to the students. Workshops also contain a wide variety of toxics, inflammables, corrosive or reactive compounds such as sulphuric acids and oxyacetylene. In the process of trying to use these machines and materials, accident could occur; therefore, workshop users (both technical personnel and students) are prone to accidents.

It is stated in the National Policy on Education (FRN, 2013) that the Federal government of Nigeria has adopted education as an instrument of effecting national development, this was the drives behind the establishment of technical colleges in both urban and rural areas. The idea therefore is aimed at bringing education to the door post of all Nigerians. The system seems to have contributed immensely towards educational imbalance between the urban and rural dwellers. Perhaps what is not clear yet is the effect of localization of technical college workshops in these areas. In human settlements urban stands for an area that is characterized by human population and vast human built infrastructures while rural areas have a low population and small settlement with few infrastructures. Health, education, employment, and development facilities are thousands times better in urban as compared to rural areas. This wholesome situation seems to have detracted qualified teachers from working in rural areas.

Uwaifo (2009) observed that it is an indisputable fact that wherever work is done with machines or hand tools, there is likelihood of accident occurring, causing injuries to people, damage to machines, tools and materials in such a workplace. Kadiri (2006), and Okeke and Oranu (2006) variously reported that an accident may be the result of an unsafe act or unsafe condition. Unsafe acts are human factors that cause accidents, while unsafe conditions are environmental factors that cause accidents. These situations can be related, since an individual's unsafe act can result in an unsafe condition for someone else. Kadiri (2006) defined an unsafe act as any act on the part of a person, which will increase the chances of having an accident. Kadiri further defined unsafe condition as that condition within the work environment which increases the worker's chances of having an accident.

The effects of accident on its victims are more serious than its effects on the economy. Not only does it affect the victim's job, it affects the family and colleagues. It becomes more painful when the accident is obviously avoidable and the cause traced to someone's laissez-faire attitude to safety or

poor supervision. Accident occurrence could also disrupt lessons or could even shutdown a workshop depending on the degree of injury sustained by the victims when it occurred. Usually where lessons are disrupted, make up lessons may be hard to organize and the syllabi may not be covered. This situation brought about the need to seek opinions of successful technical teachers on causative factors of accidents in technical college workshops.

RQ1: What human factors could cause accidents in technical college workshops in urban and rural areas of Kwara and Kogi States?

RQ2: What environmental factors could cause accidents in technical college workshops in urban and rural areas of Kwara and Kogi States?

Research Method

The design used for this study is the descriptive survey design. The population of this study consisted of the 397 technical teachers in all the technical colleges in the area of study. There was no sampling. The researcher developed the questionnaire named 'Questionnaire on Causative Factors of Accidents in Technical College Workshops (QCFATCW) which was the instrument used for data collection which was the instrument used for the for the data collection. The Likert scale was adopted for the instrument with five response options of: Strongly Agree (SA) = 5; Agree (A) = 4; Undecided (UD) = 3; Disagree (D) =2; and Strongly Disagree (SD) = 1. To validate the instrument, copies of the research topic, purpose of study and the research questions together with the draft instrument were given to two experts in technical education and one expert in measurement and evaluation all from the Faculty of Education, Nnamdi Azikiwe University, Awka. The reliability of the instrument was determined by distributing the instruments to 20 randomly selected technical teachers from Federal Government Science and Technical College, Awka and Government Technical College, Utuh in Anambra State. The data collected were analyzed with Cronbach Alpha statistics. The reliability co-efficient values obtained were 0.91and 0.93 respectively. On the whole, the instrument yielded reliability co-efficient of 0.92 which was considered high and acceptable for the study. The researcher obtained 10 research assistants who helped him to personally distribute 397 copies of the instrument to the respondents. Some respondents completed the questionnaire on the spot and they were retrieved but in most cases where on the spot completion or retrieval were not possible, therefore, the researcher and assistants re-visited the concerned respondents on agreed dates for retrieval. In all, 385 copies of the questionnaire (representing 97 percent) were retrieved and used for the study. The data collected from the respondents were collated and analyzed using the mean and standard deviation.

Presentation of Results

Research Question 1: What human factors could cause accidents in technical college workshops in urban and rural areas of Kwara and Kogi States?

Table 1: Mean Ratings and Standard Deviations on Human Factors that could cause Accidents in Technical College Workshops in urban and rural areas of Kwara and Kogi States (N=385)

S/N	Human Factors	Mean	SD	Remarks
1	Unauthorized operations of machines	3.98	1.18	A
2	Using defective tools and equipment	3.49	1.38	A
3	Engaging in horse play	3.82	1.28	A
4	Improper use of personal protective equipment	3.96	1.10	A
5	Answering phone call during operation	3.33	1.58	A
6	Failure to adhere to safety rules and regulations	4.07	1.16	A
7	Failure to tag-out/lock-out	3.91	0.77	A
8	Working on an unearthed electrical Equipment	3.50	1.12	A
9	Trying to catch a falling tool	3.28	1.12	A
10	Drinking alcohol/taking drug on duty	3.29	1.53	A
11	Using lift jack without chocking the vehicle	3.58	1.18	A
12	Carrying many materials at a time	3.55	1.14	A
13	Using strained ropes/chain/slings	3.38	1.14	A
14	Using generator in an enclosed space	3.46	1.45	A
15	Trying to stop revolving/rotating parts with hand	3.58	1.59	A
16	Welding in a confined space	3.37	1.33	A
17	Working on a suspended scaffold/ladder	2.98	1.37	D
18	Using arc welding machine to weld a part of vehicle without removing battery terminals	3.17	1.38	A
19	Stretching oneself on a ladder	3.17	1.31	A
20	Using water to quench electric fire	3.59	1.39	A
21	Improper planning	3.63	1.23	A
22	Inexperience and untrained staff	3.74	1.23	A
23	Lack of safety consciousness	4.09	1.09	A
24	Bad lifting techniques	3.88	1.04	A
25	Over confidence	3.88	1.16	A
26	Prolong activities	3.64	1.23	A

Table 1 contained 26 items in respect of human factors. It can be inferred from the data presented on Table 1 that only item number 17 had mean rating value less than the cut off mean of 3.00 in the urban areas with mean rating value of 2.98. It is therefore disagreed. Other items have mean rating values that are above 3.00 and were remarked agree.

Research Question 2: What environmental factors could cause accidents in technical college workshops in urban and rural areas of Kwara and Kogi States?

Table 2: Mean Ratings and Standard Deviations on Environmental Factors that could cause Accidents in Technical College Workshops in urban and rural areas of Kwara and Kogi States (N=385)

S/N	Environmental Factors	Mean	SD	Remarks
27	Inadequate supports or guards	4.10	0.58	A
28	Poor housekeeping	3.93	0.46	A
29	Inadequate tools and materials	4.20	0.53	A
30	Distraction from other people	3.61	1.00	A
31	Slippery floor	3.81	0.98	A
32	Substandard materials equipment	3.61	0.98	A
33	Lack of regular inspection/maintenance	4.07	0.58	A
34	Ineffective earthing system	3.87	0.46	A
35	Inadequate lighting/illumination	3.97	0.34	A
36	Lack of personal protective equipment	4.13	0.41	A
37	Overloading equipment above its rating	3.65	1.15	A
38	Leaking gas cylinder	4.08	0.61	A
39	Congestion in work place	3.99	0.60	A

The result of data analysis presented in Table 2 show that all the 13 items had mean range of 3.55 to 4.12. This range was above the cut off mean of 3.00. This implies that the items are environmental factors that could cause accidents in technical college workshops in urban and rural areas.

Discussion of Findings

With respect to research question one which were presented in Table 1 and 2 which sought to find out the human and environmental factors that could cause accidents in technical college workshops in urban and rural areas, findings indicated that failure to adhere to safety rules and regulations, inadequate tools, using defective tools and equipment, engaging in horse play, improper use of personal protective equipment, inexperienced and untrained staff, unauthorized operations of machines and poor housing keeping could cause accidents. These findings corresponded to those of Osuala (2004), Okeke and Oranu (2006), Moses (2011) and Ogunmola (2018). The authors listed failure to adhere to safety procedure and poor housekeeping as causes of accidents in technical college workshops.

Conclusion

It was concluded that human factors like failure to adhere to safety rules and regulations and environmental factors such as inadequate quantities of tools, and poor housekeeping are some of the causes of various kinds of accident in technical college workshops.

Recommendations

Based on the findings, it was recommended that:

1. Government should ensure that adequate training equipment/tools in quality and quantity are provided in technical college workshops to ensure that students properly participate in an accident –free workshops.

2. Technical teachers should organize the workshop activities with good housekeeping

in the issuance and use of materials, tools and equipment.

3. Technical teachers should constantly update their knowledge/skills through seminars, and educational advancement in order to keep abreast of new technologies.

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