WORKSHOP SAFETY PRACTICES FOR ACCIDENT REDUCTION AND PRODUCTIVITY BY STUDENTS IN TECHNICAL COLLEGES IN AKWA IBOM STATE.

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ABSTRACT

This work focused on workshop safety practices for accident reduction and productivity by technical education students in technical colleges in Akwa Ibom State. Safety in the workshop is subject to number of various risk assessment and safe code of working practices which have to be observed and adhered to by all students and other workshop users and should be enforced by the person in charge of this areas. Accidents are harmful not only when measured in human terms but also measured in terms of their impact on the overall school shop programme. The health and safety of all employees/students is closely linked to both the company and vocational technical college's productivity in all workshops. The work concludes that adequate provision of scheduled safety equipment maintenance in the workshop can reduce accident and enhance productivity. A careful selection of the best safety equipment which include among others; fire extinguishers, machinery guard, first aid box, respirator, waste can, exploratory equipment, etc. during instruction or production in the workshop can reduce accident and facilitates productivity. In line with the conclusion it is recommended among others that, adequate Personal Protective Equipment (PPE) should be used while working in the workshop. There is need for adequate storage of safety equipment to prolong the life of these equipments and reduce accident and as well enhance productivity.

KEY WORDS: Workshop, safety practice, accident reduction, productivity, technical college

INTRODUCTION

Workshop is a place where things are made or repaired. Is a class or series of classes in which a small group of people learn the methods and skills used in doing something in a shop where work and especially skilled work is carried out.

Safety in the workshop is subject to a number of various risk assessments and safe codes of working practices which have to be observed and adhered to by all workshop users and enforced by the person in charge of these areas.

Kadiri (2006) defined safety as a condition of being protected against physical, social, occupational accident, harm or any other event. Hence, safety is seen to be the concern of every one, staff, instructors, and students.

Muhammed (2010) also stated that workshop safety may be achieved by restricting the operation of a machine or tool to competent students only and observance of safety precautions. It is worthy of note that both the instructors, foremen, supervisors, and students who are involved in practical exercises in the school workshop have the responsibility to ensure safety of themselves and the safety of others around them. Based on the forgoing, there is need for proper planning of workshop safety programme. It must be adequately planned, developed and executed as any other phase of instruction. Students must be stipulated, encouraged and compelled to observe safety precaution in all their practical activities.

The workshop must be kept clean and dry. Greasy and Wet floor can result in falls with consequences of broken arms or legs. A fall can land someone in sharp objects causing unexpected consequences to the individual's health. Appropriate tools and machines must be used for each job because use of wrong tools may cause serious injury thereby affecting the individual's health condition.

In the light of the forgoing observation, one can view safety as the state of being safe and protected from danger or harm. In the same vain a workshop is defined as a place where the learner may experiment, test, construct, dismantle, repair, design, create, imagine and study. Going by this definition, a workshop is an essential place for the study and practice of technical vocational education and training.

Safe work practices are generally written methods outlining how to perform a task with minimum risk to people, equipment, materials, environment, and processes. Safe job procedures are a series of specific steps that guide a worker through a task from start to finish in a chronological order. Safe job procedures are designed to reduce the risk by minimizing potential exposure. Safe work practices should be developed as a result of completing a Hazard Assessment and should closely reflect the activities most common in the workshop or production section.

Safe job procedures are usually developed by management and workers as a result of Hazard Assessment, accident investigation and/or as a supplement to a safe work practice.

Azoda, (2014) recommended that, when students are in the workshop, they should be closely supervised by either the teacher or a workshop attendant. The responsibility of the officer in charge of the workshop is to ensure that any staff who uses the workshop occasionally should also adopt the same safety precautions and procedures as full-time workshop personnel. Safety practices however, is concerned with the prevention of accident which has the tendency to result in injury to a person or causes damages to school equipments, machines and tools. Effective

safety practice in the school workshop will benefit the school, student, and will enhance productivity, and later labour market.

However, all safe work practices should be kept in a location central to the work being performed and readily available to the workforce. Some safe work practices will require specific job procedures, which clearly set out in a chronological order each step in process. Safe work procedures should be indicated in the workshop's worker orientation" programme. All workers should be aware of the fact that safe job procedures have been established, and are written down and must be followed.

The Concept of Accident

Accident is an undesirable, incidental, and unplanned event that could have been prevented if circumstances leading up to the accident dad been recognized, and acted upon, prior to its occurrence. Generally, accident is an unplanned, unexpected, and undersigned (not purposefully caused) event which occurs suddenly and causes injury or loss, a decrease in value of the resources, or an increase in liabilities.

Thus, accident is referred to as a situation responsible for the undesired event of injuries, fatalities or any other losses. Also, accident could be any unexpected event which interrupts the normal workshop production process, caused by human, situational or environmental factors or a combination of these. It may or may not result in death, injury or property damage but has the potential to do so. It is not all accident that results in damage, injury or death in the sense that a student may slips and falls due to oil spot on the school shop floor, but the fall does not injure the student or cause any damage, but it is still classified as an accident because it interrupts the educational/training or production process and carries with it the potential for injury and damage. Yet the fact that accidents occur infrequently is not as important as the recognition that the potential for accidents is always present. An oil spot on a shop floor, for instance, may remain there for many days without anyone slipping on it or taking particular notice of it, but that does not reduce the oil spot's potential to cause injury or damage. Unless instructors and students are aware of and fully alerted to the ever present possibility of accidents, unless they act to discover and eliminate potential causes, sooner or later these cause probably will produce situations in the industrial/vocational technical education workshop where both instructors and students will witness damage, injuries or death.

Also, accidents do not occur without reason, they are caused either through (i) the improper use of tools, machine, etc. (ii) failure to use protective equipment, (iii) protective and safety equipment that has been rendered in operative (iv) failure to follow correct procedures (v) faulty equipment and tools (vi) condition of walking and working surfaces (vii) improper maintenance of equipment, and (viii) unguarded or inadequately guarded machinery.

In each accident situation, the cause can be directly or indirectly attributed to either the instructor or student (human factor), operations, tools, equipment and materials (situational factors), and condition such as noise, vibration, poor illumination, (environmental factors). So, before any attempt is made to improve the industrial/vocational technical education workshop setting and its instructional methods, operations and conditions, it is imperative that the causes of accidents be fully understood.

Accident Effect and its Reduction in the Workshop

The best way to reduce accidents in the workshop is to be proactive with prevention. Each year accidents continue to take their toll on workers in all industries. Recent figures compiled by the National Safety Council (2011) indicate that over 2,300,000 workers are disabled and over 13,000 are killed annually as a result of accidents occurring in the workplace. These statistics do not include the injuries and deaths sustained in school industrial/vocational technical education workshops.

From the figures distributed by the National Safety Council, we can estimate that during one year, Industrial/Vocational Technical Education workshops were the location of more than 22,500 accidents to boys and 1,500 accidents to girls, (National Safety Council, 2011). These figures are only for those accidents which were reported and which caused property damaged or loss of at least one half-day of school.

Accidents are harmful not only when measured in human terms, that is, the injuries and illnesses to students, instructors and others in the school system, but also when measured in terms of their impact on the overall school shop programme. Along with human losses, accidents which occur in the shop setting generally include one or more of the following results:

(i) Danger to or loss of equipment
(ii) Danger to or loss of material
(iii) Temporary or permanent loss of the use of shop facilities
(iv) Cost of medical treatment
(v) Administrative cost
(vi) Liability

To successfully reduce accidents in the workplace, there is need to consider the following:

i) Put formal safety policies and procedures in place. Create a company or workshop handbook that lists out the steps that must take place in order to prevent accidents in the work place. Include instructions such as how to store dangerous and toxic items and where certain product should be stowed to ensure safe storage and retrieval.

ii) Put someone in charge of safety in your company. Discuss the current safety policies with this safety coordinator, and work on a plan to make sure that they are adhered to. Confirm that the person is aware of all the responsibilities associated with safety. Express your support to this person and arrange to meet on a regular basis to discuss concerns about and solutions to further accident prevention and control.

iii) Communicate your expectations for a safe work environment. Let your staff and students know on a regular basis that safety is a major concern in the workshop and business. You can do this verbally and you can reiterate your expectations in memos. You can also post safety information on the workshop and school notice board. Ask your students and staffs whether they have any suggestion about improving workshop safety practices. One safety coordinator is certainly helpful, but a handful of ears and eyes are almost always preferable to just one.

iv) Inspect your workshop regularly with your safety coordinator. Make certain that the students and workers are following safety policies at work. Check areas that are of concern and ensure that precautions have been met. If you see an area that calls for concern, discuss it with the person responsible, and then arrange a meeting with all the workers to further communicate the concern and ensure that is does not happen again.

v) Schedule regular safety training for all scenarios that pose a risk for accident. Training should involve methods in picking up and carrying heavy objects and how to use mechanical equipment and tools.

To effectively reduce accident, a safety and health programme requires the active leadership and support of those at both the administrative and instructional levels.

Safety and Productivity in the Workshop

Genuine productivity gains can be realized by those businesses that invest in high performance health safety practices. If there is accident that results in injury to the worker in the workshop, the worker will be taken to the clinic or hospital, as such productivity is lost during clinic attendance as well slows down productivity of the workers.

Also, if a rusty/faulty and old machines are used in factories or workshops, these are dangerous because they may stop running abruptly and cause the machine operator unnecessary injury or death, Umeokafor, 2013).

Maintenance of Safety Equipment in the Workshop for Accident Reduction

Accidents in the workshop can be reduced to a greater extent if there is adequate and functional maintenance culture in the workshop. The writer observed that equipments and machines in some of the technical colleges in Akwa Ibom State are not operational and dysfunctional. Poor/lack of adequate maintenance of machines and equipment constitutes some of the problem facing technical colleges in Akwa Ibom State. Maintenance in an ordinary sense can be referred to as a means of sustenance, care, upkeep and action of preserving.

Emah (2007) claimed that maintenance of equipment ensures maximum operation of equipment at a minimum cost and assists in creating safe working condition/environment for students and teachers. Poor state of tools and equipment may cause injury to students or damage to the equipment. Maintenance in schools workshop could be done in two ways which include routine and preventive maintenance.

(i) Routine Maintenance: This is repetitive and on a day-to-day basis with the intention to keep the equipment clean, and in good operating condition. This involves a general clean up, disposal of scraps, oiling of machines and minor repairs due to breakdown.

(ii) Preventive Maintenance: This is an orderly continuous and scheduled procedure to prevent breakdown of equipment and prolong its life. It is done in accordance with the maintenance schedule provided by the manufacturers of the equipments; its purpose is to discover the evidence of wear and tear before it develops damaging defects. It involves periodic overhauling of the equipment, close inspection of machines after specific period and using the findings as basis for repairs or replacement of component parts (Emah, 2007).

In a study titled wastage, maintenance and effective training; implications for technical education curriculum development , it is indicated that adequate maintenance attention to equipment will affect effective training positively, while poor maintenance situation would have negative effect on effective training in technical instructions. Maintenance can reduce wastage in terms of material resources, human resources and the time by which the instructions are required to last (Essien, 2005).

Utilization of Safety Equipment for Accident Reduction in the Workshop

Utilization refers to the situation where instructors and students interact with safety equipment to facilitate learning. According to Dyreborg (2015) a careful selection of the best safety equipment such as fire extinguishers, machinery guard, first aidbox, respirator, waste can and exploratory proof equipment, when teaching in the workshop is necessary. He warned that safety equipment should not be used as mere workshop decoration during teaching/instruction in the workshop.

In selecting the best equipment, the teacher must consider the characteristics of students, which are directly related to learning, the characteristics among others include, intelligence, motivation, personal and social skills, in addition, the criterion for selection of safety equipment should include appropriateness and quality of equipments (Mouleeswaran, 2014).

Instructor's style can also influence the level of utilization of safety equipment. Teacher's style, according to Dyreborg (2015) refers to his physical disposition; such as innovation, resourcefulness, capacity, ingenuity, knowledge of operation and accessibility of the facilities. Every safety equipment, when carefully selected enhances accident reduction and improves productivity in the workshop.

Accordingly, utilization of safety facilities in the workshop alone cannot bring about the desired goal without its proper organization. For a teacher or instructor to make full utilization of safety equipment in the workshop, the workshop must be well organized. Emah, (2007) observed that proper organization create conducive atmosphere for teaching and learning. Workshop planners must ensure that first aid supplies, approved by the American Red Cross or other authoritative source, are readily accessible.

The Use of Personal Protective Equipment to Enhance Productivity in the Workshop

One of the ways an individual is protected in the workshop is through the use of personal protective equipment. There are several kinds of personal protective equipment (PPE) available for use in the workshop to enhance productivity. Some of the personal protective equipments are:

(a) Goggles: These are intended for use when protection is needed against chemicals or particles. Splash goggles which contain shielded vents at the top of the goggles are appropriate for chemical splash protection, and also provide limited eye impact protection. Goggles only protect the eyes, offering no protection for the face and neck. Students are expected to wear the appropriate eye protection devices when involved where there is potential for eye injury.

(b) Body protection: These influence work clothing, overalls or apron, etc. To enhance productivity in the workshop students should be encouraged to make proper use of overall or apron, for example if a student is given a task on metal fabrication, if the student fails to put on his or her safety overall and due to error of omission the student burns his or her dress with the metal sparks he or she will be discouraged to continue with the work having seen that his or her dress is burned and this will have negative effect on the production of that fabrication work.

(c) Face Shield: Face shields provides the face and throat partial protection from flying particles and liquid splash, a full face shield should be used in combination with chemical splash goggles. Face shield are appropriate as secondary protection when explosion

hazards are present. Face shield which are contoured to protect the sides of the neck as well as frontal protection are preferred.

(d) Hand Protection: To enhance productivity in the workshop the students are expected to wear proper hand protection equipment whenever the potential for contact with chemical, sharp objects, or very hot or cold materials exist. Leather gloves may be used for protection against sharp edges objects, such as when picking up broken glass ware. On the other hand, insulated gloves should be used when working at extreme temperature and with electricity

(e) Foot Protection: Safety foot wear are required for protection against injury from falling objects, against crushing by rolling objects and against laceration or penetration by sharp objects. Students are advised to wear proper shoes, not sandals or open toed shoes in the workshop where chemicals are used or stored or where pieces of metals are kept.

(f) Head Protection: This has to do with the use of different kinds and designs to protect the head from failing/flying objects and from limited electric shock and burn.

Jones (2006) suggested that a work area assessment is required to determine the potential hazards and select the appropriate personal protective equipment for adequate protection and facilitates productivity. This implies that productivity in the workshop by the students could be enhanced if the students are properly trained on the use of appropriate personal protective equipment for their jobs, when the equipment must be worn, how to wear, adjust, maintain and the limitations of the equipment.

Proper Storage of Safety Device for Accident Reduction and Productivity in the Workshop

Storage of materials according to Umeokafor, (2013), is the process of keeping something in a particular place until it is needed. Storage of materials in a good environment is one of the areas of concern in any workshop, this is because if the materials and tools are kept in the open, they could either be stolen or left to corrode in the presence of exchange of atmospheric condition (Puyate, 2001). This could result in negative effect or poor production result when used for a particular production process in the workshop. Puyate 2001, further stressed that equipment have to be properly kept in safe condition with respect to industrial safety, if we must reduce accident rate and enhance productivity in the workshop, the following rules regarding safety equipment storage should be adopted.

1. Store corrosive chemicals in their own specially made containers. Do not put dangerous or corrosive substances into unmarked or unsuitable containers.
2. Store paint and other flammable materials separately
3. Substances like acid which react if combined with other substances must not be stored together
4. Stored oil must never come into contact with hot surfaces.
5. Oxidizing agents must be separately stored
6. All tools and equipments which are not in use for the work at hand should be kept in their proper storage area. Area designed for the storage of fire fighting or emergency equipment must not be used for the storage of other materials. Maintain clear access to all safety equipment, life boat, etc.

Conclusion

Based on the information gathered so far on workshop safety practices for accident reduction and productivity in technical colleges in Akwa Ibom State, it can be concluded that safety is actually basic to life. Any school that ignores safety practices or pays less attention to its implementation does so at its own risk because the losses it will encounter will be enormous. It is worthy of note that accidents in the workshop will be reduced and productivity rate will be increased by adequate maintenance of workshop safety equipments, if safety equipment are properly utilized, if personal protective equipment (PPE) are used appropriately, accidents in the workshop will also be reduced if safety equipments are properly stored.

Recommendations

1. Students should be made to take part in routine maintenance in order to cultivate maintenance culture and safety consciousness in them.
2. Government (State or Federal) should take the responsibility of building a standard workshop in technical colleges and the installations of safety equipments should be given due consideration.
3. Instructors in the school shop should always ensure that students working in the workshop are always dressed with adequate personal protective equipment.
4. Safety coordinators/offices in the company or school shop should always ensure adequate storage of safety equipment to prolong the life of the equipments.

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