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# Nigerian Engineering Students' Compliance with Workshop Safety Measures

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**ABSTRACT:** Proper evaluation of various risks involved in job specifications in the workshop, and appropriate implementation, and adherence to the correct safety rules by instructors and all workshop users is a determinant factor in achievement of absolute safety in the workshop. Acquaintance and compliance with the basic safety practices in engineering profession in the course of undergraduate training makes safety engineering professionals in the field. Observance of safety measures in workshop among engineering students of Federal University of Agriculture, Abeokuta was assessed using 44-item questionnaire. The questionnaire assessed the demography, housekeeping, personal protective devices, use of equipment, tools, and machineries, first aid and hygiene observation. A sample size of 195 engineering students was recruited for the study which cut across 2nd – 5th year students of the four engineering departments in the school. The responds was, civil 35 (17.9%), mechanical 64 (32.8%), electrical 51 (26.2%) and agricultural engineering students 45(23.1%). 67 (34.4%) of the participants were in 200 level, 68 (34.9%) in 300 level, 25 (12.8%) in 400 level and 35 (17.9%) in 500 level. The compliance level of engineering students of Federal University of Agriculture, Abeokuta with the workshop safety rules was above average. Therefore for good safety competence in the appropriate field of work, more attention is needed to ensure absolute control of hazards and avoidance of injury.

**KEYWORDS:** Student, Safety, Hazard, Engineering, Workshop.

## 1 INTRODUCTION

A workshop is any building principally used for manufacturing or repairing of goods [1]. Virtually every workshop contains many potential safety hazards. However, with proper control these hazards can be eliminated [2]. Engineers, in the fulfillment of their professional duties are expected among the fundamental codes spelt out by National Society of Professional Engineers to hold paramount the safety, health, and welfare of the public and perform services only in areas of their competence [3]. Generally, engineering practices expose workers to injuries in the course of execution of any project. Mishap which causes some injury to the person, damage to machines, tools and equipment, which results in loss of production, may be prevented by worker's precautions [4]. Successful safety services improve the outcome of engineering works; add quality and years to workers life and equipment lives [4].

Proper evaluation of various risks involved in job specifications in the workshop, and appropriate implementation, and adherence to the correct safety rules by instructors and all workshop users is a determinant factor in achievement of absolute safety in the workshop. For every accident that causes a major injury, there are 29 accidents that cause minor injuries and 300 accidents that cause no injuries [5]. Many accidents share common root causes, addressing more commonplace accidents that cause no injuries can prevent accidents that cause injuries. Safety conscious work environment is an important part of preventing workplace injury, violence and even fatalities [6].

Training students in the use of safety equipment, safety procedures and prevention, and encouraging them to participate in creating a safe work environment are one of the best ways to reduce accidents and injuries [6]. Acquaintance and compliance with the basic safety practices in engineering profession in the course of undergraduate training makes safety

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engineering professionals in the field. In the provision of engineering training, the fundamental knowledge, intellectual and practical skills are among the core programmes required for all engineers. This extends to developing ones skills in workshop practice and conducting ones design, make and test projects. Many outlines on safety observances at workplaces are available etc., but no research work has been done to assess the compliance level with these workshop safety measures during project works execution. This study assessed the observance of safety measures in workshop among engineering students of Nigerian.

## 2 MATERIALS AND METHOD

This cross-sectional survey was conducted among the 2nd – 5th year engineering students of Federal University of Agriculture Abeokuta Ogun State, Nigeria. The research was conducted towards the end of 2011/2012 academic session to ensure adequate participation of respondents in practical works. Data collection tool was a two paged, 44-itemed self-administered questionnaire with 15 minutes completion time. The questionnaire assessed the demography, housekeeping, personal protective devices, use of equipment, tools, and machineries, first aid and hygiene observation. The four questions on demography assessed department, level/class, sex, number of practical participation. Six questions assessed their personal action in keeping things in their position and ensuring neatness of the workshop. Seven questions assessed proper dressing for work. Eight questions assessed use of tools while executing jobs. Six questions assessed machine handling. Twelve questions assessed caution consciousness and four questions assessed attitude towards the use of first aid facilities and personal hygiene and safety consciousness. The questionnaire was hand delivered to $3^{rd}$ – $5^{th}$ year students and completed during students' free week, normally a week before semester examination and to $2^{nd}$ year students one week to the end of Students' Work Experience Programme (SWEP). Students absent from school during the period of this study were excluded. Recruitment was voluntary and no incentive was offered. Prior to participation, aim of the study was explained to the student and informed consent obtained. The results obtained were arranged in tabular forms.

## 3 RESULTS AND ANALYSIS

195 engineering students participated in this study comprising civil 35 (17.9%), mechanical 64 (32.8%), electrical 51 (26.2%) and agricultural engineering students 45(23.1%). Gender distribution showed that males constituted 169 (86.7%) of the respondents and the remaining 26 (13.3%) were females. 67 (34.4%) of the participants are in 200 level, 68 (34.9%) in 300 level, 25 (12.8%) in 400 level and 35 (17.9%) in 500 level. All participants have adequately participated in practical work coupled with SWEP which offered the students ample opportunity to handle different equipments, tools and machineries.

Before work commences, an assessment of the risks presented by the potential hazards of the job should be carried out. This sounds very formal, and indeed formal risk assessments are normally made by competent and suitably qualified personnel in many working environments, ranging from factories, building sites and demolition sites, to schools, hospitals, shops and even offices [7]. These assessments are then used to manage the risk and to implement health and safety measures to allow work to be carried out as safely as possible [7]. It is this that brought about, the provision of the necessary information on the general safety precaution at entrance of the workshop to be observed in order to avoid hazards. These rules are very important which if ignored accident is inevitable. The degree of safety achieved in a system depends on the emphasis given [8]. Students are always received at the entrance of the workshop by the workshop instructor who passes on some vital information to them either for a new project to be carried out or for continuation of ongoing one. Over familiarity and conversance with these instructions as they sound the same most of the time does not equal compliance. The monotonous nature of these instructions makes 33 (16.9%) of the respondents violate the rule thereby divulging themselves and fellow students to unnecessary risk. Whereas 97 (49.7%) of the respondents always and 65 (33.3%) of the respondents sometimes present themselves for the instructors directives before commencement of the day activity (Table 1).

Accidents are naturally unforeseen event or occurrence that results in death, injury, or property damage but when they happen, one can't really say they are unanticipated. Accident; be it acute or mild needs immediate attention. Attending to these challenges immediately they occur before seeking the attention of medical personnel is called first aid [1]. First-aid supplies are provided for emergency use. In some cases, people exposed to these hazards may not show signs of injury or illness for years. But later accumulate and develop to more challenging health issues. When injuries occur in the workplace, medical help are always available to resolve them. The provision of first aid is not always the problem with most workshops in institutions of higher learning, but usage especially when there is no immediate burn, pain, cut or scratch. When situation like this arises, the students continue their work without letting the instructor know about the injury. Reporting to the instructor for referral to first aid personnel is very important to the worker's life. "Life they say has no duplicate" as such the respondents do not take chance in cases of their health as 64.1% and 22.1% always and sometimes report to the instructor

for immediate treatment respectively. Only 13.8% of the respondents are wholly obdurate to the rule (Table 1). The eyes or body of technical worker may be exposed to injurious corrosive materials, which demands eye washes or any other suitable equipment for quick drenching or flushing to avoid health mutilation afterward. Contact with splashed chemical liquids, powders, dusts, fumes, mists, gases, machine lubricants, degreasers, coolants, releasing agents, paint, fuel, cleaners, metal working fluids, gels or grease used around machinery could be harmful. Most of these chemicals can burn, explode, corrode, poison, or irritate. Chemicals and chemical by-products are one of the non-mechanical hazards in workplaces which need to be treated with utmost care. Peradventure any chemicals or chemical by-products touch any part of the body the same should be washed off. Only 89 (45.6%) wash off chemicals when they drop on them whether painful, irritating or not.

Knowing the signs of possible emergencies, such as how to shut down your equipment, where to find and use the fire extinguishers or worst of all how to escape from the workshop in case of overwhelming situation is very important. Most of the mishaps that happen result in either injury, occupational illness, damage to or loss of equipment or property, or damage to the environment or even death. The risk is the likelihood of it happening. Therefore it is necessary for one to be fully acquainted with one's working place. A good number of the respondents 162 (83.1%) know the emergency exit of the school workshop.

Good lighting is essential for every workshop. Artificial light are strategically placed in the workshop over work benches. Machine tools do have supplementary lighting for good vision of the operator. There are times the weather changes and the brightness of workshop dim even at that 10.8% of respondents still manage to do something with the poor illumination (Table 1).

Engineering works need utmost carefulness and attention because of the implication of poor design and fabrication. Discussing while operating a machine is very dangerous not only to the personnel working but also to the material, machine and co workers. 89 (45.6%) of the respondents adhere to this rule (Table 1).

***Table 1. Safety Consciousness/First Aid***

| Characteristics | Always n (%) | Sometimes n (%) | Never n (%) |
|---|---|---|---|
| **Present for proper welcome instruction to the workshop** | 97(49.7) | 65(33.3) | 33(16.9) |
| **Conversation while operating machine or working in the workshop** | 42(21.5) | 64(32.8) | 89(45.6) |
| **Report to concerned personnel when injured for first aid** | 125(64.1) | 43(22.1) | 27(13.8) |
| **Wash off chemicals drop on your body whether painful, irritating or not** | 89(45.6) | 64(32.8) | 42(21.5) |
| **Knowledge of emergency exit** | 162(83.1) | 13(6,7) | 20(10.3) |

Every profession has its own dress code that suits the kind of work involved. Proper dress etiquette explains vividly the understanding, one has pertaining to the duties, responsibilities, expectations and requirements in ones profession. Safety dressing is much more than just professional guise, which necessitate whether you look good or feel comfortable in your outfit. It is a conscious outfit aimed at reducing the chances of injury and safe guarding the personnel involved. Safety outfit accessories include helmet, fitted overall, safety boot, hand gloves, eye shield, muffler and nose cap [9]. Trim fitting clothing is required when doing works in workshop, especially where there is a risk of entanglement. Engineers' overalls with zipped pockets, leather footwear or boots with insulated, non-slip soles and steel toecaps are recommended. Nitrile or neoprene gloves are mandatory when handling hazardous substances. Wearing dry leather gloves and other appropriate protective clothing is a practical risk control measure that can be taken by individual worker. Helmets in good conditions are also appropriate for the process and the job, and be in good condition [9].

There are also hazards due to falling objects from work taking place at height [7]. This is protected by wearing safety boot steel toecaps. It is expected that technical or engineering personnel must have these protective devices on before entering the workshop for any technical task. Possession of these safety gadgets is a step to compliance to the rule of dressing properly. I19 (61%) of the respondents have their gadgets complete whereas 51 (26.2%) of the respondents sometimes make it up by getting from friends and 25 (12.8%) of the respondents are adamant to the rule (Table 2). 108 respondents representing 55.4% of the participants always put on all safety device before entering workshop, 53 (27.2%) does sometimes and (34) 17.4% do not (Table 2). Despite the risk and hazard involved when one is poorly dressed, only 87 (44.6%) of the respondents dress properly every time they enter the workshop because they have all the protective gadgets, whereas 65 (33.3%) and 43 (20.1%) sometimes and never dress correctly to the workshop respectively (Table 2). Having safety consciousness at the back of the mind, 111 (56.9%) of the respondents do not go the workshop except they are well dressed

for work. 60 (30.8%) sometimes does and 24 (12.3%) always make do with the available gadgets (Table 2). A rule not completely obeyed is equivalent to rule ignored. A worker putting on an overall that is loose fitted is in danger worse than one who is not putting on any protective cloth because he/she has increased the chances of being entangle to rotary part of the machine. An average number of the respondents, 102 (52.3%), have fitted overall (Table 2). Dressing properly with appropriate protective clothing is a practical risk control measure that can be taken by individual worker to reduce the chances of injury [7]. If good and appropriate equipment are available and used properly, then the risk of injury is automatically lowered. Protective equipment and clothing for the face, head, hands, arms and body are the normal risk control measures used to reduce exposure to injury especially radiation during welding processes and others in the immediate vicinity of the process being used [7].

There are many hazards which are fairly easy to be recognized and aware of, particularly some of the chemical hazards. Gases like carbon monoxide and nitrogen are colourless and odourless which make it difficult for one to sense danger when they are emitted ([7], [10]). The health effects of exposure to gases like carbon monoxide and fume include irritation of the upper respiratory tract (nose and throat), tightness in the chest, wheezing, metal fume fever, lung damage, bronchitis, pneumonia or emphysema [7]. Welding and oxyacetylene cutting processes produce high volumes of gaseous fume. These gases give great risk in breathing. Inhaling dust, spores or gases can cause serious lung injury when doing repair work ([7], [9]). In order to take care of this, it is expected that a worker put on nose cap to filter these gases. The use of respirator or nose cap is not a usual practice among the students. Only 31 (15.9%) of the respondents comply with this rule as they are seldom involved in practical that is characterized by obvious air pollutants (Table 2). This might be because there are no immediate threats witnessed. That notwithstanding it does not exterminate health challenges involved.

Usage of muffler is not found common among the students as 94 (48.2%) of the respondents has never made use of it, 44 (22.6%) of the respondents sometimes do while 57 (29.2%) of the respondents always do (Table 2). Noise is an everyday occurrence and an industrial workshop can be very noisy. Most operations in the workshop generate noise. The noise produced by various operations differs in intensity and frequency. Ancillary processes like grinding, chipping, gouging and hammering also generate varying levels of noise. Associated practices, such as crane operation and forklift truck operation, also generate noise [11]. Exposure to noise over a period of time can result in impairment or loss of hearing ([7], [10]). In traditional boiler shops where continuous riveting and hammering takes place almost every day, hearing loss is common and many platters and others became deaf after years of exposure to the noise [7]. It is also possible that permanent hearing damage can be caused by a single, intense impact noise, like an explosion. Loud impact noises can also induce tinnitus, a continuous or intermittent ringing, or other noises, in the ear [12]. Noise is fairly easy to detect but the effects can accumulate over a long period of time and so noise hazard can, surprisingly, be overlooked. Exposure to high level of noise in the workshops even for short periods can cause permanent hearing damage. Permanent damage, noise induced hearing loss, results because the nerve hairs in the ears which sense and transmit sound messages to the brain become damaged and die. When this happens the affected person mis-hears words. What does the future hold for an engineer who is to be avoided due to hard hearing? 'Impact noise' such as that caused by banging of tools can damage the eardrum or bones of the ear. The legal action level for noise is 85 dB(A) [7]. Sound levels above 85 dB, can cause damage due to sound pressure (measured in dB) and time of exposure. These effects begin to be seen with long-term daily exposure to noise levels above 65 dB or with acute exposure to noise levels above 80 to 85 dB ([13], [14]). If it is necessary to communicate by shouting at a distance of 2 meters, the noise level is likely to exceed 85 dB(A). It therefore becomes very necessary that students performing some work should put on mufflers to avoid ear damage.

***Table 2. Workshop Outfit***

| Characteristics | Always n (%) | Sometimes n (%) | Never n (%) |
|---|---|---|---|
| **Possession of complete set of protective gadgets** | 119(61.0) | 51 (26.2) | 25 (12.8) |
| **Dress complete in safety outfit before entering workshop** | 108(55.4) | 53 (27.2) | 34(17.4) |
| **Dress properly for work before entering the workshop** | 87(44.6) | 65(33.3) | 43(20.1 |
| **Making use of available outfit even if not complete** | 111(56.9) | 60(30.8) | 24(12.3) |
| **Fitted overall** | 102(52.3) | 45(23.1) | 48(24.6) |
| **Use of respirator** | 31(15.9) | 31(15.9) | 133(68.2) |
| **Use of muffler** | 57(29.2) | 44(22.6) | 94(48.2) |

The workshop should have clearly defined access areas which should be kept clear of all items and free of litters. Workshop equipment/materials should be sited in designated areas clear of access areas, generally around the periphery of

the building ([9], [15]). In the course of execution of a project so many equipments and materials are involved which are not used in the places they are kept. These equipment/materials are jumbled everywhere in the process of working but it is not expected to remain like that at the end of the working hour. Putting things in order at the end of each working hour is some sort of challenge to the engineering students. Only 90 (46.2%) of the respondents always tidy the workshop after execution of work, while 79 (40.5%) of the respondents sometimes and 26 (13.3%) never do that (Table 3). 110 (56.4%) of the respondents, always clear the bench after each work day, while 53 (27.2%) of the respondents sometimes and 32 (16.4%) never do that (Table 3). Good arrangement and placement of tools and equipment do not just show orderliness but grants easy passages through the aisle in the workshop thereby preventing avoidable injury to the personnel. 121 (62.2%) of the respondents always maintain passages free from obstruction while 54 (27.7%) and 20 (10.3%) sometimes and never do that respectively (Table 3). Untidy work areas, obstructed walkways, welding cables trailing along the floor or over fabrications, discarded items of equipment or consumable packaging present high risk of falls, trips, slips, collisions, etc., resulting in physical injury [7]. To avoid dirty in the workshop 99 respondents representing 50.8% of the study participants always make use of waste disposal bin in the workshop. Maintaining tidy workplaces, removing obstructions and discarded materials greatly reduces the risk of injury. Scraps of some materials used in the workshops are readily combustible materials like paper and cardboard [7]. These materials should not be present after working especially in the welding area. If there are no such materials in the immediate vicinity, then there should be low risk of fire. Clearing the work area of combustible materials after every work hour in the workshop reduces the risk of fire. Trash can also be from remains of edible materials. A workshop is not a refectory neither is it dinning room therefore it is not expected of any worker to eat in the workshop. Appreciable level of observance of this rule is recorded 120 (61.5%) of the respondents has never eaten in the workshop (Table 3).

Access to the workshop should be limited to persons at work [9]. It is true that there are times students are not given much time to execute their project at their own pace especially when they need regular assistance of the instructor. Students tend to congest the workshop in order to meet up with the deadline for the submission. Crowding the workshop increases the exposure of workers to injury. This demands that when the comfortable and considerable spaces are occupied it is expected that on coming students should exercise patience for there to be space. Only 47.2% of the respondents always wait when there is limited space in the workshop, while 24.1% and 28.7% of the respondents sometimes and never wait respectively for enough space before they go in for their own work (Table 3). Working in a confined space increases the risk of accidents due to contact with materials or equipment from the coworkers and the colleagues [9]. This consequently arouses some undue quarrel and unnecessary exchange of words among the students.

***Table 3. House Keeping***

| Characteristics | Always n (%) | Sometimes n (%) | Never n (%) |
|---|---|---|---|
| **Orderly arrangement equipment/material** | 90(46.2) | 79(40.5) | 26(13.3) |
| **Clear the bench after work** | 110(56.4) | 53(27.2) | 32(16.4) |
| **Keep passage free from obstruction** | 121(62.1) | 54(27.7) | 20(10.3) |
| **Use of the waste disposal** | 99(50.8) | 51(26.2) | 45(23.1) |
| **Eat in the workshop** | 34(17.4) | 41(21.0) | 120(61.5) |
| **Exercise of patience when there is limited space in the workshop** | 92(47.2) | 47(24.1) | 56(28.7) |

Availability and proper usage of appropriate equipment lowers the risk of injury to technical personnel. It is not expected that a student or any technical personnel should use any tool or equipment he/she is not conversant with. Regardless of how easy it appears to be. 54.4% of the respondents have never tried using their discretion in handling any tools or equipment, they have not been taught how to use, while 16.4% and 29.2% of the respondents always and sometimes respectively try to help themselves out, due to impatience (Table 4). A good selection of hand tools is required for every workshop. Particular care is required when handling and working with tools or machine parts with sharp edges. Such should be kept with the sharp edge covered. Some of the hand tools used in the workshop loose their handle after sometime due to age or usage, at this point it is not advisable that such tools be engaged in a technical work except if put back in order. 131 (67.2%) of the respondents always comply with this rule while 45 (23.1%) and 19 (9.7%) of the respondents sometimes and never respectively ensure that hand tools are equipped with handles (Table 4). 41 (21%) go to the extent of managing a damaged tools so long as they are still working even when they are faulty. There are situation when the desirable tools are not available, it is not expected of a trainee or a student who is still undergoing the mastering activities of engineering to improvise. This is practiced by some of these students, 44.6% of the respondents do improvise when the needed tool is delayed or not available at the time it was needed. It is the responsibility of a student working with any tools or equipment to

report mal functioning of the tools or equipment. Improper use of any tool or equipment results in usual noise. 110 (56.4%) of the respondent always report unusual signs and noise of machine to the workshop instructor whereas 50 (25.6%) and 35 (17.9%) of the respondents sometimes and never report unusual signs and noise of machine to the workshop instructor respectively (Table 4). 106 (54.4%) of the respondents report any tool damaged by them for proper documentation while 50 (25.6%) and 39 (20.0%) sometimes and never report any tool damaged by them for proper documentation to avoid the disciplinary measures respectively (Table 4).

For sustainability of the machine and the tools, a worker need to always take proper care of the tools and the equipment during and after each working hour as recommended by the producer. Taking good care of the tools and machineries improves the outcome of engineering works, add quality and years to the workers and equipment life. This ranges from usage, cleaning, lubricating if necessary to storage in the right place after use. 109 (55.9%) of the respondents always clean their tools whereas 48 (24.6%) and 38 (19.5%) of the respondents sometimes and never clean their tools respectively. 47 (24.1%) of the respondents always lubricate their tools when necessary. 73 (37.4%) and 75 (38.5%) of the respondents sometimes and never respectively observed that respectively (Table 4).

***Table 4. Tool Handling***

| Characteristics | Always n (%) | Sometimes n (%) | Never n (%) |
|---|---|---|---|
| **Use your discretion** | 32(16.4) | 57(29.2) | 106(54.4) |
| **Ensure that your hand tools are equipped with handles** | 131(67.2) | 45(23.1) | 19(9.7) |
| **Manage faulty tools/equipment** | 41(21.0) | 100(51.3) | 54(27.7) |
| **Improvisation of tools when not readily available** | 87(44.6) | 71(36.4) | 37(19.0) |
| **Report unusual signs and noise of machine** | 131(67.2) | 46(23.6) | 18(9.2) |
| **Report damaged tool** | 106(54.4) | 50(25.6) | 39(20.0) |
| **Clean the tools after work** | 109(55.9) | 48(24.6) | 38(19.5) |
| **Lubricate their tools** | 47(24.1) | 73(37.4) | 75(38.5) |

Manual handling of loads is either lifting, holding, lowering, pushing, pulling, carrying or moving of cylinders, tools, materials, equipment and consumables, etc. [16], [17] Either of these can present a hazard often in the form of cumulative disorders due to gradual and cumulative deterioration of the musculoskeletal system through continuous lifting/handling activities [17]. Other general sources of hazard on industrial premises include forklift trucks, mobile cranes, overhead cranes, moving machinery, site transport, delivery vehicles and so forth [7]. General safety hazards and hazards encountered during manual handling are usually easy to recognize with some training [7]. These include moving machinery, falling objects, forklift trucks, mobile cranes, overhead cranes, site transport and hazards presented during manual handling of gas cylinders, tools, materials, equipment and consumables. One of the most common injuries experienced by workers is back injury during manual handling [7]. The work area itself is likely to present a variety of safety hazards associated with access and exit points, where the work area is situated, gangways, cranes, steps, ladders, staging, scaffolding, pits, materials, tools, cables, machinery, plant and equipment, etc [7]. Moving, lifting, carrying, etc., presents a high risk of injury if the things moved are heavy, large or awkward, or not lifted, carried or moved properly. Using specialized or dedicated lifting equipment and systems reduces the risk of injury. If proper training in correct manual handling is undertaken, the risk of injury due to lifting or carrying, etc. will be reduced. Table 5 shows various manual handling operations and the level of students' compliance with them. Work-related low back pain and injuries are the most common musculoskeletal disorders caused by manual handling operations [17]. Factors that increase the risk of injury include the load being too heavy, large, difficult to grasp or unstable, the task being too strenuous or involving awkward postures or movements, and the working environment lacking sufficient space, having slippery, uneven or unstable floors, having extreme temperatures or poor lighting [17].

*Table 5. Manual Handling*

| Characteristics | Always n (%) | Sometimes n (%) | Never n (%) |
|---|---|---|---|
| **Single handedly lifted something too heavy for one person** | 69(35.4) | 69(35.4) | 57(29.2) |
| **Use of hooks or crane to carry heavy object** | 57(29.2) | 74(37.9) | 64(32.8) |
| **Gathering more people to lift heavy object when lifting device is not available** | 105(53.8) | 65(33.3) | 25(12.8) |
| **Lifting an object in such a way that the weight of the object become part of your weight** | 67(34.4) | 66(33.8) | 62(31.8) |
| **Having object lifted in static body position** | 50(25.6) | 75(25.6) | 70(35.9) |
| **Check object for heaviness before lifting it** | 119(61.0) | 51(26.2) | 25(12.8) |
| **Check object if well packed before lifting** | 132(67.7) | 51(26.2) | 12(6.2) |
| **Check for proper grasp of load before lifting** | 134(68.7) | 52(26.7) | 9(4.6) |
| **Ensuring that weight is well packed and balanced it won't move around** | 133(68.2) | 53(27.2) | 9(4.6) |
| **Ensuring tight grip on the object before lifting** | 153(78.5) | 32(16.4) | 10(5.1) |
| **Slow and smooth movement while picking an object** | 96(49.2) | 78(40.0) | 21(10.8) |
| **Use a hand truck, trolley or a forklift** | 20(10.3) | 77(39.5) | 98(50.3) |

## 4 CONCLUSION

Engineering practice has many hazards that have the potentials to cause injury or damage to health. The risk of injury or damage to health occurring depends on how hazards are dealt with or controlled. Freedom from those conditions that can cause death, injury, occupational illness, damage to or loss of equipment or property, or damage to the environment is safety. Everybody has a responsibility to work safely and not to endanger themselves or any other person at work [7]. Workers have a duty to take care of their own health and safety and those of others, and must not intentionally or recklessly interfere with or misuse anything provided for health and safety. The health safety and environment act applies to all people at work and others persons in, or in the vicinity of, a place of work whereas the establishment have a duty to provide information, instruction, training and supervision to ensure health and safety at work [7]. Although the compliance level of the engineering students was found to be 61.3% for proper dressing, 68.8% for use of first aid facilities, 60.1% for house keeping, 68.2% for tools/equipment handling and 64.5% for manual handling, adopting absolute safe work practices to avoid any form of hazard is imperative when doing all workshop works.

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