

Management Systems for Metal Technology and Design Workshop Safety, Health and Environmental Hazards in Selected Secondary Schools in Zimbabwe

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ABSTRACT

Learners using school workshops encounter numerous safety, health and environmental problems. Inadequate and ineffective facilities and equipment expose learners to serious health complications or injuries. Unguarded and uninsulated machine connections have the potential to injure learners. There is risk of serious property damage and injuries due to inconsistent application of safety, health and environments procedures. The Social Learning Theory informed the study anchored with ethnographic research design as located in the interpretivist paradigm. Interviews, observations and documents were data collecting methods. The findings revealed that inadequate teaching resources affected effective teaching and learning on safety, health and environmental practice. The study further revealed that malfunctioning electrical safety equipment exposed learners to injuries. The study recommended that schools provide all the necessary resources to prevent safety, health and environmental accidents. In addition, the study recommended that schools develop an Occupational Health and Safety policy and give someone responsibility for dealing with such issues. The study also recommended that the Ministry of Primary and Secondary Education should include occupational health issues in the existing National School Health Policy.

Keywords: Safety, health and environmental hazards, management systems, accidents

INTRODUCTION

Workshop disasters in schools are growing in school-based environments rendering the workshop environment harmful. These lead to injuries, health problems, and accidents that may cause disability or in extreme cases may lead to the death of learners. Losses may occur due to damage to equipment and tools in the workshop resulting in decreased productivity.

Observing safety precautions is crucial in ensuring that accidents are minimised or eliminated in school workshops. The use of electric machines such as welding machines can cause serious health as well as environmental problems. According to Workplace Health and Safety Queensland (2021), welding is a potentially hazardous activity, and precautions are required to avoid electrocution, fire, explosion, burns, electric shock, vision damage, inhalation of poisonous gases and fumes, hearing loss, and exposure to intense ultraviolet radiation. The fumes can also affect surrounding people and cause respiratory tract irritation, resulting in a dry throat, coughing, chest tightness, and breathing difficulties (Mgonja, 2017).

Accidents are a major concern in workshop practice in schools. Workshop accidents may occur due to several unexpected factors, leading to damage and claiming lives. Design, setting or operation errors, which cause accidents in workshops are noticed only if learners start a task and encounter several risks. Workshop accidents and ailments may mostly stem from system problems, design errors, inconvenient and neglected equipment and machines, human-related factors, and lack of education and supervision (Uysal, Ozciftci & Kurt, 2005, as cited in Yurtçu, 2019).

Injuries in the school environment are a serious public health problem. Injuries occurring within the school workshop class are a part of this problem that has received little to no attention (Knight, Junkins jr, Lightfoot, Cazier, & Olson, 2000). A study was done in America to describe the epidemiology of workshop class injuries in Utah public schools for the years 1992 to 1996.

The study revealed that from 1992 to 1996, 14 133 students in grades 7 through 12 were injured at school, of which 1008 (7.1%) were injured during a workshop class. The majority (88.4%) of shop injuries involved equipment use. Equipment was misused in most cases and malfunctioned in a few incidents. The leading injuries reported for workshop equipment were lacerations, burns, and abrasions, whereas the leading for no equipment injuries were lacerations, fractures, and pain/tenderness. In 1996, most students were injured in a workshop class and a few visited an Emergency Department (ED) as a result of the workshop injury (Knight, et al., 2000). Equipment was a major contributor to the workshop injuries admitted to the ED. Table saws, other saws, and band saws were involved in nearly one-half of the equipment injuries. The majority of equipment misuse incidents resulted in an ED visit, and a few cases came from equipment malfunction. The majority of students sustained an open wound injury. A few students required inpatient hospital care. Six of the students were injured using a table saw and 1 sustained injuries attributable to automotive cleaning fluid. Equipment was used improperly in 4 of the table saw injuries. Six of the students sustained hand injuries, with 3 suffering a traumatic amputation of a finger or thumb. Observing safety precautions is essential in making the working environment safe, particularly when using machines.

The use of machines and equipment in the workshop ranks high as a cause of serious injuries, accidents, and deaths in the school workshop. An 18-year-old teenage boy from Ottawa in Canada died as a result of injuries sustained in a workshop class accident. The boy and his friends were making barbecues from steel barrels, using hand grinders, when a spark ignited vapours in the barrel and caused an explosion (Cameron, 2012). The School Board was fined after pleading guilty to failing as an employer to provide the teacher with instruction and supervision on safe work practices and the dangers associated with the project.

In another incident in New Zealand, six students and a teacher were injured, some critically after an explosion at a Northland school that blew out a workshop's windows and embedded tools in walls (Northern Advocate, 2005). A leaking acetylene gas cylinder is believed to have caused the blast. The blast occurred during a class attended by 18 year-11 students, a teacher, and a teacher's aide, and was so loud it was heard across the town. As a result of the blast six boys and their teacher, a man in his early 40s, were taken to the hospital. Four were critically injured.

In America, an explosion at Healdsburg High School metal workshop injured a teacher and student. Officials said that both were taken to Healdsburg District Hospital with moderate and minor leg injuries. The explosion came as an accumulation of acetylene fumes exploded under a shop room cabinet. The debris hit the knee of a metal workshop teacher when it blew open the cabinet. A student suffered a deep cut on his leg. The workshop has a series of acetylene torches set up for students. The teacher was using a brazing torch in the area when a student came over to work as well. When the student lit the torch the gas fume build-up under the workbench ignited and threw the student and the teacher about a meter away. There is a need for enough adequate safety precautionary measures to ensure that injuries are avoided as well as damage to equipment (Rossmann, 2009).

Health and safety issues also affect students in colleges and universities and serious measures should be put in place to ensure that the working environment becomes safe and conducive to good working. In America, a Yale University senior was killed in an accident by a machine shop lathe (Hanna, 2011). The student was working on a project in the Sterling Chemistry Laboratory's machine shop when her hair got caught in a lathe, a machine that shapes material by rotating it against a tool. The cause of death was asphyxia due to neck compression, and the manner was accidental. Negligence of safety precautions particularly when using machines can be fatal. Hair long than four inches can be drawn into machine parts such as suction devices, blowers, chains, belts and rotating devices. It can even be drawn into machines guarded with mesh. Therefore, hair must be securely fastened with a hair net or soft cap to ensure this type of accident is prevented (McGinnis, 2018).

A study was done in Turkey to investigate the work accidents taking place in vocational and technical high schools. The findings indicated that the types of work accidents are often machine and equipment injuries,

electric shock, limb cuts, falling objects and burns (Yurtçu, 2019). The study further revealed that accidents caused by machines from machines or equipment are the most common types in terms of the type of accidents in vocational and technical high schools. Additionally, it was found that 10th-grade students are more subjected to work accidents when compared with others and the accidents often take place in the early times of the day. The causes of the accidents were often human-related factors and fortunately, they often end up with no injury. Emerging evidence suggests that several ateliers, such as electric-electronic, metal technology, ICT technologies, furniture design and school buildings are common locations where work accidents take place. The study also revealed that the basic causes of work accidents, mostly stem from human mistakes or negligence of safety precautions. Additionally, working environments and such equipment as machines are the causes of workshop accidents. The findings clearly show that workshop accidents result in mild injuries, outpatient treatments and injuries which prevent individuals from servicing. The study also revealed that accidents caused damage to machines and equipment, stoppages in production and services, severe injuries, damage to the workplace, limb losses and death. Further analysis revealed that 10th and 11th-grade students in vocational and technical schools are often subjected to work accidents since they are inexperienced in terms of the related occupation and its machines or equipment. It was found that there is a clear reduction in the statistics of work accidents including among 12th-grade students (more than 50%). This can be attributed to their increased knowledge and awareness of both related occupations and principles of OHS. In this regard, it would be better to suggest that the freshman students must be provided a detailed education on OHS and paid more attention in terms of risks and dangers in workplaces

The term Musculoskeletal disorders according to the World Health Organization (2003), denotes health problems of the locomotor apparatus, that is muscles, tendons, the skeleton, cartilage, ligaments and nerves. Musculoskeletal disorders include all forms of ill health ranging from light, transitory disorders to irreversible, disabling injuries. Musculoskeletal disorders (MSDs) are one of the most common occupational health hazards and serious health concerns among teachers. About 39% to 95% of teachers suffer from musculoskeletal pain that can lead to a decline in their performance, frequent sick leaves, and early retirement, and can have a negative impact on their quality of life. A study carried out to investigate the prevalence of and risk factors for MSDs among secondary school teachers in Hail, Saudi Arabia revealed, that the overall prevalence of MSDs was 87.3% (Althomali, Amin, Alghamdi, & Shaik, 2021). Female teachers suffered more than their male counterparts. The most common site was the lower back, followed by the shoulders and knees. Most of the participants reported MSDs in multiple sites. A high prevalence of MSDs can be due to a substantial lack of awareness and practice of ergonomics, which warrants the development of preventive strategies and educational programs.

A study was done on the Management of electrical/electronics workshop accidents in technical colleges in Oyo and Ogun states Nigeria (Afeez, 2016). The findings from the study show that these accidents occur at least once a month. From the findings, it was observed that, falling below the working level, striking legs against an object, exposure to harmful chemicals, slipping to the surface in a workshop, and exposure to electric shock among others include accidents that are moderately occurring, that is, accidents that occur at least once in a month in electrical/electronics workshop in technical colleges in Oyo and Ogun States. However, it was also discovered that the falling of Objects; inhaling of poisonous gases; crushing by machines and tools, and exposure to high temperatures in the workshop occur slightly. This implies that those accidents occur at least once in a term or section. Accidents in school workshops can result in a reduction in students' enrolment. The findings of the study revealed that electrical/ electronics workshop accidents can be managed by providing well-stocked first aid boxes to the workshop and giving adequate training to teachers and workshop attendants on the method of administering it. It was recommended that workshop attendants or technologists should be recruited and updated always for proper monitoring of students' activities inside the workshop.

Erick and Smith's (2014) study involving Botswana teachers also gives vital statistics about the prevalence of MSDs among African teachers. The MSD prevalence of any body part was 83.3% among the respondents. The prevalence was higher for the upper back, followed by the shoulders, and then the neck. The prevalence was least reported in thighs and elbows (Erick and Smith as cited in Ndonye, 2019).

For metal technology and design learners, this is further worsened by the practical tasks that are performed in the workshop. Design projects involve repetitive tasks such as cutting, grinding, and filing, further worsening the situation and leading to MSDs. The learners are more likely to be affected by MSDs.

Ergonomics is concerned with Uche & Okata (2015) the ‘fit’ between people and their technological tools and the environment. It considers the user’s capabilities and limitations in ensuring that tasks, equipment, information and the environment suit the user. A study was done in Zimbabwe to examine the ergonomic hazards that are associated with steel manufacturing at a plant in Redclif. Several injuries arising from poor ergonomics were gathered through the survey (Mamvura & Steven, 2017). Twenty-two percent of the respondents indicated that they experience burns due to poor ergonomics while 19.44% indicated they experience both cuts and burns. Others indicated they experience cuts alone (8.3%); cuts and back aches (8.3%), others just minor injuries (5.6%), burns and back aches (13.89%). Poor ergonomics at the steelmaking plant mainly accounts for instant injuries.

The ergonomic hazards at the steelmaking company constitute heavy loads, heat, uncomfortable work spaces and repetitive work (Mamvura & Steven, 2017). Students are faced with risk factors such as manual material handling of heavy loads, overexertion, awkward posture, and repetitive motions also implying the risk of musculoskeletal disorders. Accident registers show injury statistics are on the rise from the period 2012 to 2015 signifying the growing concern for ergonomic interventions. It was established during the study that over 60% of the respondents are not aware of the issue of ergonomics and some even suffer ergonomic injuries unaware and they do not report it.

The statistics presented above raise significant concerns for institutions of higher learning regarding the safety of students working in such environments. Most colleges and universities send students for industrial attachment and such Workshop environments pose serious health and safety concerns for students. Measures should be put in place to ensure that students are equipped with information on ergonomic hazards in different industrial operations. This will result in a safe conducive environment for students and will prevent injuries and some permanent conditions such as Musculoskeletal Disorders (MSD). Failure to report ergonomic accidents and conditions also makes managing ergonomic issues difficult.

The government of Zimbabwe through the Ministry of Primary and Secondary Education in collaboration with other government agencies crafted a School Health Policy which guides schools in learner welfare issues .This policy is silent on explicit hazards which learners are exposed to in school workshops .Accidents in school workshops continue to happen and no specific guidance on handling such issues at school level are in place save for general safety and precautions.

Statement of the problem

Accidents are happening in the school’s Metal Technology and Design (MTD) workshops but are not being reported. Schools are not adhering to effective safety, health and environmental practices in school workshops resulting in these accidents. The government has introduced the School health policy in schools to guide the implementation of several health-related interventions relating to the welfare of learners in the school system. The policy remains a rhetoric without concrete guidelines on managing workshop safety, health and environmental concerns. Issues to do with accountability when accidents happen are not openly covered in the school health policy meaning management of these mishaps are inconsistently catered for. Despite having these efforts in place school -based accidents continue to happen in school workshops necessitating the study.

Research question

Why is it important to have management systems in place to deal with safety, health, and environmental hazards in school workshops?

Objective

Investigate management systems in place to deal with potential safety, health and environmental hazards in school workshops.

Conceptual framework – The Social Learning theory

In dealing with safety, health and environmental issues in school workshops the Social Learning theory can

be a powerful tool to deal with such problems. Social learning theory (SLT), is predicated on the notion that learning occurs through social observation and subsequent imitation of modeled behaviour. Albert Bandura proposed the social learning theory in 1977 (McLeod, 2016). According to SLT, humans learn from observing the actions and resulting consequences of others. By doing so, individuals can learn to imitate the observed behaviour, and thus reap the rewards, or they can learn *not* to imitate a particular action and thereby avoid the disagreeable consequences (Lyons & Berge, 2012).

The people who are being observed are called models and the process of learning is called modeling (Newman & Newman as cited in Nabavi, 2012). Bandura stated second and third stages of social learning, imitation and behaviour modeling, will occur if a person observes positive, desired outcomes in the first stage. If, for example, a learner attends a lesson and a safe demonstration of a particular skill during a practical MTD lesson and is entertained, informed, and approves of the way the teacher has demonstrated, they are more likely to want to demonstrate to others. They can then use the behaviour they experienced to imitate and model the teacher's teaching styles when practicing a certain skill. The use of STL theory can help to create a safe and conducive environment for learners in school workshops by reducing or eliminating safety, health and environmental problems.

LITERATURE REVIEW

School Health Policy

Guided by the Constitution of Zimbabwe (2013), the Education Act, and the Public Health Act, the Ministry of Primary and Secondary Education, in collaboration with the Ministry of Health and Child Care, embarked on the development of the School Health Policy. The need for a school health policy was highlighted in the 1999 report by the Presidential Commission of Inquiry into Education and Training which inspired the design of the Curriculum Framework (2015 – 2022). Furthermore, this policy fulfils the recommendation of the Health Commission Report of 1999 which highlighted the need for the provision of comprehensive health services for schools. Section 64 Subsection 1 of The Education Act, as amended in 2006, stipulates that the Minister of Primary and Secondary Education in consultation with the Minister responsible for Health shall make regulations to safeguard the health of learners (Government of Zimbabwe, 2018). This policy provides a broad frame of reference to guide the implementation of several health-related interventions relating to the welfare of learners in the school system, such as nutrition, water, sanitation and hygiene, additional needs of learners with disabilities, mental health, sexual and reproductive health concerns, and the care and support provisions including guidance and counselling services for all learners

School Occupational Health Safety

Schools are facing increasing expectations and pressures many of which need to be addressed immediately. However, there are good reasons to treat Occupational Health Safety (OHS) as a core issue for schools. If it is an integral part of school planning, and addressed as part of other school processes, it contributes to the school's goal of providing excellent educational outcomes for learners (WorkSafe Victoria, 2017). It is well known that learners perform better in a school whose teachers have high motivation and morale. Significant contributors to high motivation and morale among teachers is freedom from the risk of physical or psychological pain and disease, such as pain resulting from injuries, joint or muscle pain, back pain, stress, anxiety or depression. Good OHS performance in schools is linked to improved morale, reduced sick leave and improved retention of teachers and other staff. Putting effort into OHS is an excellent way to demonstrate to teachers that the school authorities' team cares about their wellbeing. This results in fewer injuries, greater job satisfaction, increased motivation and better learner performance. School communities expect that school authorities will ensure that learners who come into the school will go home at the end of the day as healthy as they arrived. Furthermore, schools have a unique opportunity to model healthy and safe workplaces for their learners, who are the employers and employees of the future. Good OHS performance reduces the risk of public liability claims. All schools have a legal obligation to provide a healthy and safe workplace so far as it is reasonably practicable to do so.

Managing risks in the workshop

To successfully manage safety, health and environmental risks in the school workshop the hierarchy of control

can be quite useful. The hierarchy of risk control or hierarchy of control is the ranking of ways to control risks from the highest level of protection and reliability to the lowest (Queensland Government, 2022). In Australia, the WHS (Workplace Health and Safety) Regulations require the hierarchy to be used in the determination of controls to manage risks in practical activities. This means the most effective control measure, which is to eliminate a hazard is to be considered first. If this is not reasonably practicable to do this then the risks are to be minimised by substituting the hazard with something safer. This can involve physically separating the source of harm from learners by distance or using barriers. If risks cannot be minimised use of personal protective equipment (PPE) and administrative controls are only to be used when there are no other practical control measures available as a last resort. These control measures do not control the hazard at the source. They rely on human behaviour and supervision, and used on their own, tend to be least effective in minimising risks (Queensland Government, 2022). Two approaches to reduce risk in this way are administrative controls and the use of personal protective equipment (PPE). Administrative controls are work methods or procedures that are designed to minimise exposure to a hazard, for example, develop procedures on how to operate machinery safely, limit exposure time to a hazardous task, and use signage to warn learners of a hazard paint yellow 'safe working zone' lines on the floor around all fixed workshop and machinery

Reporting of Injuries, Diseases and Dangerous Occurrences

Teachers must report incidents and keep appropriate records of workshop accidents that cause death and workshop accidents that cause serious injuries. Reportable injuries include diagnosed cases of certain workshop diseases and certain dangerous occurrences (incidents with the potential to cause harm). Not all accidents need to be reported except when the accident happens when learners are doing different operations in school workshops or the accident results in an injury of a type that is reportable (Black, 2015). Injuries that should be reported include the death of a worker arising from a workshop accident. Specified injuries to learners in an accident in the workshop which include fractures, amputation, loss of sight, crush injuries, in admittance to hospital for more than 24 hours. Reportable occupational diseases in school workshops include diagnosis of certain occupational diseases where these are likely to have been caused or made worse by their workshop processes. These include carpal tunnel syndrome, severe cramp of hand or forearm, occupational dermatitis, hand– arm vibration syndrome, occupational asthma, tendonitis and any occupational cancer (Black, 2015). Dangerous occurrences that can be reported include certain specified 'near miss' events, where something happens that does not result in an injury, but could have done. These include explosions or fires causing workshop processes to be stopped for more than 24 hours (Black, 2015).

First aid

Learners in the workshop can suffer injuries or become ill. It is important what is that they receive immediate attention and that an ambulance is called in serious cases. The school should provide adequate and appropriate equipment, facilities and personnel to enable first aid to be given to learners if they are injured or become ill in the workshops. It is important to remember that accidents can happen at any time so first aid provision must be available at all times to learners in the workshop (Black, 2015).

A suitably equipped first aid box, fixed to a wall, should be easily accessible in every school workshop to give immediate help to learners injured or who develop serious health complications. The contents of the box should be checked frequently. It is not sufficient that there should be first aid equipment in another part of the school. Teachers should have sufficient knowledge of first aid to be able to cope with injuries arising from ordinary workshop accidents, including electrical shock, with confidence and speed. It is important to ensure that at least two teachers in every school have been trained in administering first aid. In addition, school heads should encourage their staff to undergo some form of training in first aid. In the event of any serious injury, or whenever in doubt, medical aid should be sought without delay (The Government of the Hong Kong, 2020).

Fire risk assessment

Schools should carry out fire risk assessments in workshops to protect learners. A fire risk assessment is an organised and methodical look at the workshop, the activities carried out there and the likelihood that a fire could start and cause harm to those in and around the workshop (HM Government, 2006). The fire risk assessment

aims to identify the fire hazards, to reduce the risk of those hazards causing harm to as low as reasonably practicable and to decide what physical fire precautions and management arrangements are necessary to ensure the safety of learners in the workshop if a fire does start.

It is important for safety reasons that every learner should know where the portable fire extinguishers, the hose reels and the controls for extinguishing are located and how to operate extinguishers in their working shop (Black, 2015). Training must include the use of extinguishers on simulated fires. Tackling a small fire with an extinguisher may make the difference between a small incident and a full-scale disaster. Portable fire extinguishers save lives and property by putting out small fires or containing them until the fire brigade arrives. They should only be used for fighting a fire in its very early stages. It must be stressed that fire fighting should only be attempted if it is safe to do so and that an escape route must always be available. It is also essential to emphasise the limits of first-aid fire fighting to show the need to attempt this safely and the importance of first raising the alarm.

Learners are often confronted with fire hazards in school workshops. It is good practice to provide learners with some form of fire safety training so that they are aware of the actions to be taken in the event of a fire. This should include instruction on the details of the emergency plan, the importance of fire doors and other basic fire-prevention measures, the importance of reporting to the assembly area, exit routes and the operation of exit devices. Once the emergency plan has been developed and training given, it is important to evaluate its effectiveness. The best way to do this is to perform a fire drill. This should be carried out at least annually or as determined by the fire risk assessment (HM Government, 2006).

Education and Awareness

Lack of finances to buy instructional media results in teachers often failing to inculcate safety practice skills into the learners. This makes the workshop environment dangerous as learners will not have the necessary skills for doing certain operations (Sini & Abubakar 2018). In Zimbabwe, the Curriculum Development Unit and the Technical Services Department (CDTS) are responsible for designing and disseminating resources like instructional media to schools (Ministry of Primary and Secondary Education, 2021).

METHODOLOGY

The qualitative approach was used therefore the study adopted the interpretivist paradigm. The study sought to find out management systems for Metal Technology and Design workshop safety, health and environmental hazards in school workshops. Purposive sampling was used in this study comprising 3 teachers and 4 administrators. A random sample was conducted to select 8 learners and 2 secondary schools. The study adopted an ethnographic research design. Thematic analysis was used for analysing the data. Documents analysis was also used as well as observations. Participants were coded to ensure confidentiality. Learners were coded as L1-L8, teachers T1-T3 and administrators A1-A4.

RESULTS AND DISCUSSION

The data was presented and thematic analysis was used to analyse the key issues from the data. Presentation of data covered occupational health and safety issues in school workshops, management systems for dealing with safety, health and environmental issues, ways of dealing with accidents and challenges in making learners aware of safety, health and environmental issues.

The person responsible for dealing with safety, health and environmental issues in the school workshop.

The study aimed to discover who was responsible for dealing with safety, health and environmental issues in the school workshop. The question that was put to forward to learners was "Who is responsible for dealing with safety, health and environmental issues in the school workshop?" In response to this question, learners had similar responses. L8 said:

The teacher is responsible for dealing with safety, health and environmental issues in school workshops.

While L5 remarked:

The teacher is responsible for the safety of learners.

Teachers were asked the same question on who was responsible for dealing with safety, health and environmental issues in the school workshop. The question that was put to learners was” Who is responsible for dealing with safety, health and environmental issues in the school workshop. In response teachers had same the different opinion. T1 actually said:

The teachers is responsible for dealing with such issues.

While T2 remarked

Teachers are responsible as well as some of the learners.

The same question was asked to administrators on who is responsible for dealing with safety, health and environmental issues in the school workshop. In response, administrators had different opinions. A3 said:

The teachers is responsible for dealing with safety, health and environmental issues in. the workshop but if there is a serious problem they report it to the administrators.

While A2 remarked that:

There is a committee that deals with such issues or the teacher can deal with some of the issues depending on severity.

The picture that emerged from the data was that teachers were responsible for dealing with safety, health and environmental issues in the school. Although teachers deal with safety, health and environmental issues in workshop, the school should assign people at the school dedicated to dealing with safety, health and environmental issues in the school. This ensures effective management of safety, health and environmental issues in the school workshop. This is supported by WorkSafe Victoria (2017) which say schools should establish a dedicated OHS committee which has one OHS representative. This will enable schools to deal with possible risks found in the workshop.

Systems in place to deal with potential safety, health and environmental hazards in school workshops.

The study sought to find out the systems that were in place to deal with potential safety, health and environmental hazards in school workshops. The question that was put forward to learners was” What systems are in place to deal with potential safety, health and environmental hazards in school workshops? Explain Fully.” In response to the question asked learners had similar responses. L3 said:

Fire fighting training for fires assembly point in case of fire and sound siren.

While L7 remarked:

Fire extinguishers are in place to deal with fires.

Teachers were asked the same question about the systems that were in place to deal with potential safety, health and environmental hazards in school workshops. In response to the question, teachers had similar opinions. T3 said:

Fire drills so that in case of a fire learners know what to do.

While T2 remarked:

Overall school-based system fire drills with escape routes well labelled.

The same question was posed to administrators on the systems that were in place to deal with potential safety, health and environmental hazards in school workshops. In response to the question, administrators had similar opinions. A1 remarked that:

Fire drills are performed yearly learners gather at fire assembly points in case of fire.

While A4 said:

There is a disaster risk management team to deal with issues such as fire hazard risk management, ensure learners are accounted for during a fire, come up with a risk management plan and also have emergency numbers for the fire brigade and ambulance in case of emergency.

The indication from the data was that fire drills are necessary to reduce or eliminate risks caused by fires. Information gathered from observation revealed that fire extinguishers were not serviced making it difficult to conduct fire drills. Schools should ensure that learners receive training on fire safety to prevent injury, loss of life and losses caused by fires in workshops. This is supported by HM Government (2006) which says, that learners are often confronted with fire hazards in school workshops. It is good practice to provide learners with some form of fire safety training so that they are aware of the actions to be taken in the event of a fire. This should include instruction on the details of the emergency plan, the importance of fire doors and other basic fire-prevention measures, the importance of reporting to the assembly area, exit routes and the operation of exit devices. Once the emergency plan has been developed and training given, it is important to evaluate its effectiveness. The best way to do this is to perform a fire drill carried out at least annually or as determined by the fire risk assessment (HM Government, 2006).

Ways of handling learners involved in an accident in the workshop.

The study pursued to find out how the school handle learners who are involved in an accident in the workshop. The question that was put forward to learners was” How does the school handle learners who are involved in an accident in the workshop?” In response to the question asked learners had similar responses. L3 said that:

The learner is taken to the clinic after first aid if the injury is serious.

While L7 remarked:

First aid for injured learner and hospital care after if serious.

Teachers were asked the same question on how the school handles learners who are involved in an accident in the workshop. In response to the question teachers had similar opinions. T2 said that:

First aid is provided in the workshop but if the first aid kit has no supplies the injured learner is taken to admin for first aid. Learners are taken to the hospital for serious injuries.

While T3 remarked:

First aid for immediate help for learners injured an ambulance is called to take the learner to the hospital if the injury is serious.

The same question was posed to administrators on how to how the school handles learners who are involved in an accident in the workshop. In response to the question, administrators had different opinions. A1 said that:

First aid kits to assist learners injured. There is also a sick bay for injured learners at the school.

While A4 remarked

First, render first aid and call the parent if serious to take the learner to the hospital. The District Education office is also informed of the incident depending on severity. The teacher documents injury and works out a plan

to prevent future injury.

The responses showed that first aid was being given to learners injured in the workshop before seeking further help. Information gathered from observations revealed that teachers were also not trained in first aid and accidents were not being reported or documented. It is necessary to train teachers in first aid so that they can assist learners injured in the school workshop. This is supported by The Government of the Hong Kong (2020) which says school heads should encourage their staff to undergo some form of training in first aid. In the event of any serious injury, or whenever in doubt, medical aid should be sought without delay. Teachers should also keep records of all serious accidents as well as report such accidents. According to Black (2015), teachers must report incidents and keep appropriate records of workshop accidents that cause death and workshop accidents that cause serious injuries. Reportable injuries include diagnosed cases of certain workshop diseases and certain dangerous occurrences (incidents with the potential to cause harm).

Challenges raised when teaching about safety, health and environmental practice in workshops?

The study wanted to inquire how the administration responds to the challenges raised when teaching about safety, health and environmental practice in workshops. The actual question put forward to teachers was "How does the administration respond to the challenges raised?" Teachers had different opinions on the question raised. T1 said:

Change of teaching methods by use of ICT tools such as videos to make instruction effective.

While T3 remarked:

Have not raised any of the challenges faced when teaching about safety.

Administrators were asked the same question on how they respond to the challenges raised when teaching about safety, health and environmental practice in workshops? In response to the question, administrators had different opinions. A1 remarked:

The school should conduct holiday lessons for learners to have sufficient time to learn as well as off-sessions.

While A4 said:

Finance the department so that teaching becomes effective as well as engaging a resource person so that effective teaching takes place.

The responses showed that there was a shortage of resources to effectively teach about safety, health and environmental issues in workshops. There is need to make finances available so that all required resources are made available so teaching becomes effective. This is supported by Sini & Abubakar (2018) who say lack of finances to buy instructional media results in teachers often failing to inculcate safety practice skills into the learners. This makes the workshop environment dangerous as learners will not have the necessary skills for doing certain operations. It is also interesting to note that administrator A4 says the department should be financed as it is the duty of administrators to do so. It also shows that the administrator is ill-informed as some of the teaching material such as charts and danger warning signs used in workshops can be obtained for free. In Zimbabwe, the Curriculum Development Unit and the Technical Services Department (CDTS) are responsible for designing and disseminating resources like instructional media to schools (Ministry of Primary and Secondary Education, 2021). This type of media helps learners to grasp safety, health and environmental concepts which in turn reduces incidents and accidents in school workshops.

CONCLUSION

From the findings, it can be concluded that facilities that deal with safety, health and environmental issues are inadequate in school workshops. This renders the workshop environment very dangerous to learners performing different operations in the workshop. Teachers also faced challenges in imparting the necessary safety education to learners. As alluded to above the schools should ensure that all the necessary resources are made available so that learners acquire the required knowledge of safe procedures for certain processes. Management systems

were in place to deal with potential safety, health and environmental threats in the workshop. This was not sufficient to effectively deal with these threats. The teachers is tasked with the responsibility of teaching and dealing with these issues which gives an extra burden. Schools should therefore develop their own OHS policies to effectively deal with safety health and environmental issues that threaten learners. OHS policy helps schools to effectively assess risks found in the school workshops and ways of mitigating or eradicating these risks.

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