# MANAGEMENT PRACTICE OF METALWORK STAKEHOLDERS IN THE MAINTENANCE OF TOOLS AND EQUIPMENT IN TECHNICAL COLLEGES IN NIGER STATE.

**BY**

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**2014/1/49865TI**

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**AUGUST, 2021**

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**A PROJECT SUBMITTED TO THE DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION,**
**SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION,**
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**INDUSTRIAL TECHNOLOGY EDUCATION (METAL WORK)**

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## DECLARATION

I hereby declare that this project titled: “management practice of metalwork stakeholder in the maintenance of metalwork tools and equipment in technical college in Nigerstate” is a collection of my original research work and it has not been presented for any other qualification anywhere. Information from other sources (published or unpublished) has been duly acknowledged.

**ABAH USMAN UGBEDE**

**2014/1/49865TI** _____

Signature & Date

## CERTIFICATION

The project titled: “management practice of metalwork stakeholder in the maintenance of metalwork tools and equipment in technical college in Niger state ” by ABAH USMAN UGBEDE with the matric number 2014/1/49865TI meet the regulations governing the award of the degree of bachelor of technology in the Department of Industrial and Technology Education, School of Science and Technology Education, Federal University of Technology, Minna and it is approved for its contribution to scientific knowledge and literary presentation.

Dr. I.Y. UMAR _____

Supervisor Sign & Date

Dr. I.Y. UMAR _____

Head of Department Sign & Date

_____ _____

External Examiner Sign & Date

## DEDICATION

This project work is dedicated to my God Almighty.

## ACKNOWLEDGEMENTS

The researcher profound and unquantifiable gratitude goes to Almighty God for the wisdom guidance protection and strength He bestowed on me throughout my Programme in Federal University of Technology MINNA despite all the challenges encountered. The researcher special appreciation goes to his able supervisor Dr I.Y. Umar for his guidance towards successful realization of this project and to all Industrial Technology Education department lecturers. Especially the Dean of school of science and technical education Prof I.A Gambari , Deputy Dean Dr A.M. Idris, H.O.D Dr I.Y. Umar, Prof A.S. Ma'aji, Prof B.N. Atsumbe, Prof. R.O. Okwori, Dr. E. Raymond, Dr. G.A. Usman, Dr R Audu, Dr B.M Mohammed, Dr .I. Dauda, Dr. AbudulKadir M, Dr T.M Saba, Dr.C.O Igwe, Dr. A.S Owodunni, Dr.A.B Kagara, Mall. S.M. Adamu, Dr W.B. Kareem ,Mr. D.A. Opeyemi, Mr .F. Abutu , Mrs F.C. Nwankwo, Mall. .A. Mustapha, Mr .B.J. Ekhalia, Mr .S.N. Yisa and other staff of Industrial Technology Education department.

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## ABSTRACT

The study investigated the management practice of metalwork stakeholder in the maintenance of tools and equipment in technical colleges in Niger state. A descriptive survey research design was adopted. The targeted population for this study consist of 50 respondents, 20 metalwork teachers and 10 instructors from technical colleges, that were randomly selected in Niger state. Thirty items were developed in the questionnaires was validated by the lecturers in the Industrial and Technology Education Department. A total of 50 validated questionnaires were issued to the instructors and teachers: 10 and 40 respectively. The data was analysed using the SPSS software. The findings of this study have implications for the Government, school administrator and the teachers of metalwork technology.

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# CHAPTER ONE

## 1.0 INTRODUCTION

### 1.1 Background of the Study

Technical Education aimed at imparting to its recipient's practical skills, basic scientific knowledge, attitude and competence that enable them to work very effectively in industrial and self-reliance ventures. Technical colleges are regarded as the principal vocational institutions in Nigeria. They give full vocational training intended to prepare students for entry into the various occupations (Okoro, 1993). According to Abdulkadir (2011) the responsibilities of technical college education in Nigeria include: provision of full time or part-time courses of instruction and training in technology, applied science and commerce, in such other field of applied learning, relevant to the needs of the development of Nigeria in the areas of industrial, commercial and vocational agriculture, professional studies in engineering and other technologies and perform such other functions as in the opinion of the society as may serve to promote the objectives of the technical colleges.

The Federal Republic of Nigeria National Policy on Education (2004) made the production of craftsmen, artisans and other sub-professional skilled personnel the responsibility of technical college education and maintained that trainees completing technical college programmes shall have three options: Secured employment either at the end of the whole course or after completing one or more modules of employable skill, Set up their own business and become self-employed and be able to employ others and Pursue further education in advance craft/technical programme and in post-secondary (tertiary) technical institutions such as science and technical colleges, polytechnics or colleges of education (technical) and universities. Metalwork trade is offered in technical colleges, polytechnics, monotechnic, colleges of education (technical) and universities. College of education (Technical) is a level

of education for production of technical teachers with Nigeria Certificate in Education (NCE). Eyibe (1998) stated that one of the objectives of technical education at NCE level is to produce technical teachers who will be able to inculcate scientific and technological attitudes and values into the trainees. Metalwork technology teachers in technical colleges are expected to inculcate these skills in their students as contained in the curriculum. This can be achieved through effective teaching. Britton in chukwuani (1989) stated that for teaching to be a pleasure and be effective, that the tools and equipment needed in workshop must be of appropriate number through proper planning and maintenance.

However, the attainment of these goals is largely dependent on the effective maintenance practices of tools and equipment available in the workshop. The maintenance of equipment tools and facilities for the teaching and learning of metalwork is of great importance these days as Nigeria lays much emphasis on the use of metal and production of metal products. Considering the benefits we derive from metalwork, there is need to improve the maintenance of equipment and tools. Dervistotis (1981) stated that poor maintenance can result in defective output, unsafe working condition and increased production cost due to repairs and excessive downtime. Uzoagulu (1993) noted that functionality of equipment, tools and facilities and their availability could only be ensured through prompt maintenance.

Management technique refer to various strategies or methods of managing tools and equipment. The major concern of good management technique is the identification and judicious utilization of available tools and equipment to achieve the objective of helping the learners to learn and to encourage them to want to learn (Ogwo & Oranu, 2006). In essence, management technique has to do with the process of bringing out the best from the tools and equipment so as to achieve the set goals and objectives of practical lesson. Management according to Tarig (2008) is defined as a process of coordinating work activities so that they are completed efficiently and effectively with and through people. He went further to say that

management is a process of planning, organizing, leading and controlling all activities of the organization in pursuit of pre- determined objectives. Davis (2007), listed management functions to include: planning, organizing, leading or motivating, coordinating and controlling. Management in the context of this study is the act of planning, organizing, controlling and coordinating the activities of metalwork technology tools and equipment in order to achieve its objectives.

Equipment are portable or heavy mechanical devices for vocational technical operation in the laboratory, workshop or field laboratory. Olaitan (1999), observed that the use of equipment is mainly on technically specialized skill practices in the instructional and learning situations. Equipment in this study refers to machines usually power driven for cutting, drilling and boring of holes, welding and processing. It also includes tools held in the hand for doing work. Tools and equipment according to Odigbo (1999) refers to either fixed or movable objects, equipment, supplies and facilities which may be private, public or government property that may be turned into educational use for attainment of set goals. Tools and equipment in technical education are the essential concrete features that enable the instructor teach effectively in Industrial Technical Education workshop and classrooms (Okoro, 1991 and Oranu, 1994). Wang (1993) stated that tools and equipment which he called physical facilities helped the teacher to convey intended messages effectively so that learner receives, understands, retains, and applies experiences gained to reach overall educational goals. The study is therefore carried out to identify the management technique for improving maintenance of metalwork tools and equipment in Technical colleges in Niger state.

In education, the term stakeholder typically refer to anyone who invested in the welfare and success of a school and it student, including teachers, student, the society or curriculum planners. Stakeholders may also be collective entities such as local business, organization, advocate group medial outlets. In addition to organizations that represent specific groups

such as teachers unions, parent teacher association, principals, school board or teachers in specific academic disciplines for example (The national council of teachers of mathematics).

In a word, stakeholders have a ‘stake’ in the school and its student, meaning that they have personal, professional civic or financial interest or concerns. The idea of a “stakeholder” intersects with many school-reform concepts and strategies—such as leadership teams, shared leadership , and voice

—that generally seek to expand the number of people involved in making important decisions related to a school’s organization, operation, and academics. For example, shared leadership entails the creation of leadership roles and decision-making opportunities for teachers, staff members, students, parents, and community members, while voice refers the degree to which schools include and act upon the values, opinions, beliefs, perspectives, and cultural backgrounds of the people in their community. Stakeholders may participate on a leadership team, take on leadership responsibilities in a school, or give “voice” to their ideas, perspectives, and opinions during community forums or school-board meetings, for example.

Stakeholder-engagement strategies are also widely considered central to successful school improvement by many individuals and organizations that work with public schools. Because some communities may be relatively uninformed about or disconnected from their local schools, a growing number of educational reformers and reform movements advocate for more inclusive, community-wide involvement in a school-improvement process. The general theory is that by including more members of a school community in the process, school leaders can foster a stronger sense of “ownership” among the participants and within the broader community. In other words, when the members of an organization or community feel that their ideas and opinions are being heard, and when they are given the opportunity to participate authentically in a planning or improvement process, they will feel more invested

in the work and in the achievement of its goals, which will therefore increase the likelihood of success.

## 1.2 Statement of the Problem

Federal government of Nigeria procured a series of equipment and tools and distributed them to various secondary schools in 1980 (Olaitan, 2010). Some of these equipments were not properly installed or maintained for the correct usage of students and teachers. Uzoagulu (2013) observed that regrettably a lot of equipment imported to accelerate technological education in this country have remained uninstalled, under-utilized and uncatered for. The equipment and tools in metal work are meant for the acquisition of practical skills by students. Proper maintenance of these equipment is of great importance for achieving the objective for which the technical college was established. Obede (2008) stated that some tools and equipment are locked up in the workshop as a means of maintaining, managing and to prevent them from being vandalized. Some of the equipment and tools are not cared for where they are kept. Based on the above background, evidence still show that there are no proper measures for maintenance of metalwork equipment and tools in the study area Okafor (2007). Therefore, the study is to identify the management practice of metalwork stakeholder in the maintenance of metalwork tools and equipment in technical college in Niger State.

## 1.3 Purpose of the Study

The main purpose of this study is to identify the management practice of metalwork stakeholder in the maintenance of metalwork tools and equipment in technical college in Niger State. Specifically, the Study is design to identify:

1. Identify the planning strategies for the maintenance of metalwork tools and equipment in technical colleges.
2. Identify the organizing strategies for the maintenance of metalwork tools and equipment in technical colleges

3. Identify the coordinating strategies for in the maintenance and of metalwork tools and equipment in technical colleges.

**1.4 Significance of Study**

This study will benefit the following people and body if the findings are properly put into practice: Teachers, Students, Curriculum planners and The society

This study will determine management techniques of tools and equipment in teaching, thereby enabling the teachers to be informed on how to improve their knowledge and skills on management and utilize of tools and equipment as integral part of teaching and learning. This can be done by using the finding to organize seminar for teachers to educate them on management of tools and equipment.

Students are the focus of all educational improvement. As the quality of teachers improves through the seminar, the quality of knowledge and skills imparted to the students gets improved. Thus, students will be equipped to meet with the challenges in the labour market. Moreover, the students' skill development and demonstration will undoubtedly increase the labour force and thereby improve the nation's economy, which in turn will enhance people's standard of living.

The findings of this study will equip the curriculum planners with necessary information on management of tools and equipment. This will enable them to emphasize management of tools and equipment in the curriculum of technical teacher education so as to facilitate teaching-learning process. It will also enable them to look out for skills in management of tools and equipment even during teacher's selection for employment.

Finally, the society will benefit from the study since they are the beneficiaries of end product of any curriculum process. When the students are skilful and productive, they will be useful to their community and to the wider society.

## 1.5 Scope of the Study

The study is delimited to the management practice of metalwork stakeholder in the maintenance of metalwork tools and equipment in technical college in Niger State. Management techniques of material resources include, planning, organizing, controlling, coordinating. This research work covers the areas of planning, organization and coordinating so that the study can be more effective.

### 1.6.1 Research Questions.

The following questions were formulated for this study

1. What are the planning strategies for the maintenance of metalwork tools and equipment in technical colleges?
2. What are the organizing strategies for maintenance of metalwork tools and equipment in technical colleges?
3. What are the coordinating strategies for the maintenance and of metalwork tools and equipment in technical colleges?

## 1.7 Hypotheses

The following null hypotheses were formulated to guide the study.

**$H0_1$:** There is no significant difference between the mean responses of teachers and stakeholders of metalwork technology, on the planning strategies needed for proper management practice of metalwork tools and equipment

**$H0_2$:** There is no significant difference between the mean responses of teachers and stakeholders of metalwork technology on the organizing strategies needed for proper management technique of metalwork tools and equipment.

**$H0_3$:** There is no significant difference between the mean responses of teachers and stakeholders of metalwork technology on the coordinating strategies needed for proper management technique of metalwork tools and equipment.

# CHAPTER TWO

## 2.0 LITERATURE REVIEW

### 2.1 Tools and Equipment Management in Technical Education

Tools and equipment management is an integral part of the overall management of the school. The actualization of the goals and objectives of education require the provision, maximum utilization and appropriate management of tools and equipment. Furthermore, advances in science and technology, necessitate that the school manager should adopt modern method of tools and equipment management. Tools and equipment according to Odigbo (1999) refer to either fixed or movable objects, equipment, supplies and facilities which may be private or government property that may be turned into educational use for the attainment of set goals. In view of Okoro (1991) and Oranu (1994) tools and equipment, which they called physical facilities in technical education, are the essential concrete features that enable the instructor teach effectively in industrial technical education workshop and classroom. Asiabaka (2008) defined tools and equipment as facilities provided for staff and students to optimize their productivity in teaching and learning. Tools and equipment include the building, machines, workbenches, equipment, tools and consumable items which the instructor/teacher manipulates in order to cause learning to occur. This implies that tools and equipment are those items, which the teacher turns to for help in his goal of seeking activities that would help him perform the job of instruction. In addition, whatever the teacher uses as aid in order to teach a lesson could be referred to as tools and equipment. These tools and equipment play pivotal roles in actualization of educational goals and objectives by satisfying the academic needs of students. Asiabaka (2008) stated that the educational system has undergone tremendous changes in delivery and architectural design, increase in student enrolment, multiplicity of curricula programmes and introduction of Information And Communication Technology (ICT). The resultant effect of all these changes is the need for

creative and innovative steps in the management of tools and equipment. Tools and equipment management is a process that ensures that buildings and other technical systems support the operations of an organization (Fenker, 2004).

The International Facilities Management Association (2002) described tools and equipment management as the practice of co-ordination of physical workplace with the people and the work of the organization. Tools and equipment management in technical education is the application of scientific methods in the planning, organizing, decision-making, co-ordination and controlling of physical environment of learning for the actualization of the technical education goals and objectives. This involves among other things, provision of equipment for academic activities, maintenance of all facilities and review of management practices and processes. This implies that tools and equipment management is a collective responsibility of the federal, state, local government authorities, staff and students of individual schools. Uwaifo and Uwaifo (2009) stated that government and school administrators should provide good learning environment. He added that all vocational and technical education teachers should be acquainted with the principles and practices of using and managing tools and equipment most efficiently and effectively. Onyemachi (2004) in agreement stated that the effectiveness of any tool, equipment and machine in performing specific function will be the outcome of effective management by lectures, instructors, students and school administrators alike.

Uzoagulu (1995) pointed out that for technological education to be effective, a culture of prudent management of available local and imported materials must be developed to avoid wastage of resources. Adebesin (2003) stated that mis-management of available instructional facilities in vocational technical department aggravate its inadequacy and added that despite the inadequacy of equipment materials and tools, the few available ones suffer from lack of good management and maintenance. He regretted that in many instances, personnel needed to

operate and manage these resources are not available, thereby rendering many of these machines and equipment non-functional. In the same vein, Asiabaka (2008) reported that available facilities in most schools may well be regarded as obsolete in terms of quality and quantity. He submitted that these facilities or tools and equipment were provided when the students population in the school was reasonably low when compared to the population of the same school presently using the same resources. According to the report of the educational facilities laboratories (1968), adjectives used to qualify such tools and equipment are rigidity, inaccessible, sterility, formality, isolation, starkness, immobility and permanence. These facilities no longer satisfy present day needs. It is therefore necessary that technical education department should carry out comprehensive assessment of the tools and equipment in the department to determine areas of need. This requires an integrated effort of all stakeholders who possess the expertise needed for accurate up-to-date assessment of all aspect of school facilities. Olaitan, Nwachukwu, Igbo, Onyemachi and Ekong (1999) outlined the principles that management of tools and equipment should follow. These include;

1. Equipment and tools should be organized in sequence like uses, size, colour for ease of reference and accountability.
2. Proximity to uses should be of high priority. This will afford free access to them
3. Lost or damaged tools should be replaced for continuity of programmes.
4. Tools should be organized and arranged so that the supervisor can inspect and identify immediately worn out, broken and lost ones.
5. Hazardous substances or materials subject to abuses must not only be stored securely but should also be under control.
6. Careless loss of materials due to perforation or vandalisation must constantly be checked.

7. Waste must be minimized. These principles, if matched with management techniques or methologies for material resource management will improve the actualization of goals and objectives of technical education.

## 2.2 Planning the Tools and Equipment

Planning is the first step of every successful undertaking because it sets all other functions and activities in orderly proceeding. It is the beginning of the process of management. Before a manger organizes, leads or controls, he must make plans that give purpose and direction to activities and tasks. In submission of Koontz, O'Dennel and Weihrich (1982) "planning is deciding in advance what to do, how to do it, when to do it and who is to do it. Planning bridges the gap from where we are, to where we want to go. It makes it possible for things to occur which would not otherwise happen". They added "planning involves selecting objectives and strategies, policies, programmes and procedures for achieving them either for the entire enterprise or for any organized part thereof".

Thus, it is the process that determines enterprises objectives and selecting future courses of actions necessary for their accomplishment. "Planning is very important to the organization because it helps enterprise to succeed, provides directives and sense of purpose, help managers cope with change and contributes to performance of other management functions. In view of Carlson (1982), planning is foreseeing our desired objectives, anticipating problems and developing solutions. He further refer to its as the practical thinking, dreaming and scheming that it takes to isolate, determine and schedule the actions and the achievements required in order to attain objectives. Obi (2003) opined that planning introduce rationality to the extent that it allows an organization to achieve optimal use of human, material and financial resources in meeting educational objectives and at the same time achieve effective co-ordination between educational and other types of national development. Okoro (1999) outlined the following as the steps involved in planning. - a dear

definition of the objectives of the programme - an analysis of the steps required to achieve the objectives - an estimate of time, efforts and resources involved in each step - an examination or appraisal of the risk involved and make allowance in respect of uncertainties in each alternative course of action. Any action without adequate plan leads to non-achievement of the objectives of such plan in an organization.

Planning of metalwork technology resources is important to the future direction and success of the programme. The National Policy on Education (2004) stated that the success of any system of education is hinged on proper planning. This calls for metalwork lecturers and instructors to have good knowledge about planning of tools, equipment and activities carried out in the workshop. Such plans include plans for purchase of tools, machines and other consumable materials that would be needed for developing course outline, unit lessons, learning activities, methods to be used for particular lesson and time required for unit lesson. Contributing, Oranu (1994) provides that planning for tools and equipment for school workshop include finding the nature of the course to be offered and what level the course is going to and the number of students to be taught at a time. In consonance with this, Okoro (2006) identified the two basic planning functions of technical and vocational college administrator.

These include: planning the curriculum and planning the courses. He emphasized that planning curriculum involves determining what courses should be offered by the school or college. These include developing the syllabus, or course guide and planning the physical facilities. Planning the course involves planning how approved courses could be effectively and advantageously taught using the facilities and resources available. It involves the management of time and the effective distribute of tasks between various members of teaching and non-teaching staff so that the best possible use can be made of the skills and competencies of each staff. In the opinion of Olaitan, Nwachukwu, Igbo, Onyemachi and

Ekpng (1999), planning of tools and equipment in metalwork technology is based on the following principles;

1. Equipment and tools should be organized in sequence like uses, size, colour for ease of reference and accountability.
2. Proximity to uses should be of high priority. This will afford free access to them.
3. Lost or damaged tools should be replaced for continuity programmes.
4. Tools should be organized and arranged so that supervisors can inspect and identify immediately worn-out, broken and lost ones
5. Hazardous substances or materials subject to abuses must not only be stored securely but should also be under control.
6. Careless loss of tools and materials due to perforation or vandalism must be constantly checked.
7. Waste must be minimized.

They further explained that in planning resources in metalwork technology, the teacher should undertake the following activities;

1. Identify and arrange the objectives of course content sequentially.
2. Selecting and organizing the learning experience
3. Identity and putting in place the network and facilities for teaching metalwork technology.
4. Implementing and evaluating the planned course content.

The authors further stressed that for effective planning of tools and equipment in metalwork technology that teachers should be aware of certain criteria. These include: understanding clearly, the activities involved in metalwork technology; being conversant with process of planning; being committed to the activities of planning in decision making; making provision

for adequate resources to be used in metalwork technology. To this end, Tarig (2008) asserted that planning provides direction, reduces uncertainty, minimizes waste and redundancy and sets the standards for controlling educational activities. This implies that planning of tools and equipment for teaching of metalwork technology will minimize waste and provide learning experiences that will prepare students for work environment. To this effect, teachers and instructors should recognize the importance of planning for the tools and equipment for effective teaching of metalwork technology education. Nwachukwu (2006) commensurate this by stating that good planning gives the impetus to effective learning. For the planning to be effective, he outlined the basic considerations that must be made. These include:

1. Availability of adequate materials, tools and equipment for the workshop practices
2. Provision of adequate time to assemble the available materials.
3. Adequate scheduling of work in the workshop for the learner and instructors.
4. Grouping arrangement for learners to ensure effective laboratory work.
5. Allocation of materials and equipment to groups or individuals.
6. Available supportive personnel to assist learners by way of providing their specific needs.
7. Conducive environment for laboratory/workshop activities.

These basic considerations serve as starting point in planning and are equally necessary to ensure that the requirements for laboratory lessons are realized. Nwachukwu (2006) further stressed that in planning laboratory/workshop lessons that the quantity of materials available for the lesson should be known and whether the materials will meet the needs of the lesson. He asserted that these available materials should be carefully assessed to ensure that they cover the needs of all laboratory/workshop classes. Tools and equipment should be in good working condition before commencement of the laboratory lessons. Planning of tools and equipment serves some important purposes in teaching of metalwork technology. It helps in

realizing objectives and creates a conducive learning environment for students' acquisition of practical skills. Carlson (1982) highlights the following as some of the most important purposes of management planning:

1. To clarify end results desired as criteria for measuring performance and overall plans and schedules so that every manager in the organization knows what is expected of the organization as a whole and as a department.
2. To determine and interpret what each segment of an organization must do so that every function is integrated with all related activities and all duplications and gaps are avoided in so far as possible.
3. To provide clear-cut policies for the guidance and coordination of personnel who are accountable for day-to-day executive decisions.
4. To anticipate problems and take corrective action before they become critical and to coordinate all significant activities so that personnel facilities and materials are available as required and assignment completed on schedule.
5. To establish and maintain administrative controls necessary to assure the attainment of desired results in conformity with approved objectives, policies and programmes.

## 2.3 Organizing the Tools and Equipment

Organizing of tools and equipment means the arrangement of materials in a systematic and orderly way, such that they can easily be located when needed. Certo (1982) define organizing activities as the process of establishing orderly uses for all materials resources in an organization. This orderly use emphasize the attainment of management system of metalwork objectives and assist lecturers not only in making objectives apparent, but also in clarifying which resources will be used to attain them. Samuel (2001) identified five main steps of organizing process. These include: reflecting on the plans and objectives, allocating

resources and directives, establishing major tasks, dividing major task into subtasks and evaluating the results of the implemented organizing strategy. He further explained that the primary purpose of the organizing process is to enhance productivity and attain the goal of the organization. This implies that metalwork lecturers/instructors should reflect on objectives as he/she organizes the tools and equipment for teaching of metalwork technology in view of Obi (2003), organizing is the element of administration that is concerned with relating all the components of an organization into a coordinated whole so as to achieve set goals.

He further stated that components of organizing should be considered for effective organization of tools and equipment. These components include: - the job to be done - the people to perform the job the tools to be used in doing the job it is the responsibility of teachers of metalwork technology to organize the tools, equipment and machines to enhance safely, security and proper utilization of resources. Zahraddeen, Aliyu, Kurya and Aminu (2006) posited that organizing is to assemble basic resources and arrange them in such a way that will accomplish objectives set at planning stage. It involves scheduling of duties and assigning responsibilities for effective achievement of plans in most logical and practicable way. Robbins (1993) pointed that organizing involves determining what tasks are to be done, who is to do them, when the tasks are to be grouped, who reports to who and where decisions are to be made.

Metalwork activities must be organized in orderly manner and students must be arranged in an acceptable pattern so that they can work together to accomplish stated goals. Olaitan, Nwachukwu, Igbo, Onyemachi and Ekong (1999) conceive organization as careful and coordinated arrangement of metalwork activities within a plan. They further explained that organization is the process of putting into efficient working arrangement all the resources that

help in implementation of the programme curriculum. In the opinion of Nwachukwu (1994), organizing represents the way resources connect together to achieve objectives and that must depend on the skill of the teacher. He further elucidated the responsibilities of laboratory/workshop teacher/ instructor in organizing materials resources.

These include:

1. To arrange all resources is to laboratory in conformity with safety regulations. Store the materials in a lockable cabinets or open pigeonhole boxes. In either case, it need to be organized to permit easy access to the desired materials.
2. Organize instructions to allow for delegation of responsibilities.
3. Arrange students into groups for instructions and demonstrations in a small and comfortable area or around a piece of machine. - arrange facilities that will enhance security of the laboratory users.

To this regard, Okorie (2002) considered the following principles important for effective organization of tools and equipment. They include: machine and tools should be organized in reference and accountability, proximity to users should be high priority; lost or damage tools should be replaced for continuity of the programme. Tools should be arranged so that teachers can inspect and identify immediately worn out broken and lost tolls. Everard and Greoffery (1985) in agreement to this stated that it is important to make sure that materials resources actually present in a school are known and that there is need for keeping up to date inventories which are periodically checked. This implies that metalwork teachers and instructors should make up to date inventories of tools, equipment, machines and consumables that will help to minimize lost and enhance effective teaching and learning of metalwork technology.

Akinsehimoa in Peter (2003) stressed that sawdust, shavings and other waste materials should be removed daily, floors should be kept free from oil and water for safety reasons and that all materials must be returned to their storage places after use. All this is to be done to achieve maximum organization of the available materials, tools, equipment and machines. In the view of Olaitan, Nwachukwu, Igbo and Ekong (1999) materials resources are the devices developed or acquiredto assist technical and vocational teachers to transfer skills and attitudes to learners within an instructional situation directed toward learning and acquisition of skills for work. They stated that these resources should be arranged and used in the laboratories/workshops in accordance with the various operations being carried out within the laboratory and workshop for effective teaching and learning of metalwork courses.

Metalwork course differ in contents, objectives and approaches of teaching and therefore the difference in the tools, equipment and other materials to be employed in the teaching/learning situations. These differences therefore call for the need to organize and arrange materials to match the need and capabilities of the students based on intended concepts and skills to be taught and learnt. It is to this regard that Nwachkwu (2006) considered the following as the criteria needed for organization of tools and equipment for effective teaching of metalwork technology. These include the:

1. Objective of the intended experiences
2. Content of the lesson
3. Capabilities of the learners
4. Skills to be demonstrated
5. Supportive services to be performed
6. Teachers manipulative skills
7. Learners level of maturity
8. Product to be produced

9. Situation to be used Contributing Ogwo (2004) explained that the sole aim of a well
10. Organized laboratory/workshop is to maintain prescribed standards of conduct essential for efficient teaching, student participation in the learning process, good personal relationship and sound learning.

Odor (1995) stated that good material resource organization has the following characteristics:

i. It should be efficient, the teacher and the students should be able to work with maximum
ii. productivity and minimum of wasted energy, time and resources.
iii. It should provide safety and healthy environment in which to work. The students should be able to complete task or activities in good physical condition as they entered. Workshop must be well illuminated, properly ventilated, minimum noise and safe machineries
iv. It should permit the teacher to be in control of workshop and the resources all the times. This means that teacher should have line of sight to all parts of the workshop.
v. It should provide for psychological needs of the student. The environment must be one that fosters desirable attitudes and promotes mental well-being.
vi. It should provide security for the instruments and supplies to the laboratory/workshop - It must facilitate the making of sound decision
vii. It must promote individual and group understanding as well as acceptance of common goals.
viii. It must encourage creative planning and proper coordination of individual and group activities
ix. A good organization must ensure continuous evaluation.

Tools and equipment in to metalwork technology should be organized in order that materials and supplies may be received and checked without the interruption of other tasks. When these resources are well organized, it will enhance developing in students an insight and understanding needed for management in technological fields. Therefore, effective organization of tools and equipment will not only increase the performance of the instructors/teachers but will also help the students to acquire the manipulative skills required to prepare them for immediate employment in the world of work.

## 2.4 Coordinating the Tools and Equipment

Coordination is the brain in the body of management. McNamara (2008) defines coordinating as monitoring and adjusting resources and processes to achieve goals and objectives in a highly effective and efficient fashion. Coordination deals with synchronizing and unifying the actions of a group of people. Coordination is a management function, which results in the integration of the activities of people in the use of facilities and materials and handling the assets of the enterprise to accomplish unified approach to pre-determined goals and objectives. Nwachukwu (2006) stated that coordinating is the task of management whereby the plans and organization are kept under continuous surveillance so that operating efficiency is monitored and difficulties are foreseen.

Effective coordination ensures smooth running of a set up. Effective coordination of tools and equipment for teaching of metalwork will create enabling environment and ensures that all materials are put to use for students acquisition of skills. Olaitan,Nwachukwu, Igbo, Onyemachi and Ekong (1999) stated that when tools and equipment are effectively coordinated, the result will be the production of efficient, effective and employable graduates. The effective co-ordination of tools and equipment in view of Adabo (2009), will result to job oriented programmes which will improve the production of technical manpower. He further stated that it will minimize the importation of technical gadgets from other countries.

## 2.5 Availability of Functional Tools and Equipment in Technical Colleges

Technological education is pivoted on the availability of functional tools, equipment and machines. Students in technical education are expected to do a lot of workshop practice or practical. These practical's can only take place in an environment where adequate and relevant tool and equipment are available. Tools are instrument held in hand and use to form, shape, fasten, add to, or change something by cutting, hitting, boring etc. Tools in metalwork education from national commission for colleges of education list include among others; files, screw drivers, hammers, pliers, side cutters, etc. Nwachukwu (2006) described tools and equipment as all portable and heavy instruments or mechanical devices useful for performing special operations in a vocational and teaching- learning situation. Simpson and Anderson (1981) defined equipment as items that last a minimum number of years or cost more than a certain amount and stated that they are essential for the attainment of educational objectives. Research investigations have revealed that students level of performance is affected by such facilities as laboratories, poor equipment and school buildings. In teaching of metalwork, practical work is complementary to theory.

Teaching and learning in technical education needs to be done with well-equipped laboratories/workshop capable of giving students adequate knowledge and skills. Opone, G (1997) supported this fact by stating that practical approach enhances manipulative skills in students. In the same vein, Odubunmi (1993) stated that some teaching facilities as tools and equipment in some schools are un-used and some are rotting away out of non-maintenance. Adding, Britton in Nwando (2006) emphasized that tools and equipment must be in perfect condition for success to be achieved in technical education. Also for teaching to be a pleasure workshop facilities and hand tools must be of appropriate numbers through proper planning. Non-availability of functional tools can limit programmes in metalwork education. Nwaogu

(1985) asserted that no matter the strength of manpower resources in the system, educational process must require conducive physical accommodation, equipment and machines. When these facilities are lacking, teachers are hardly effective in their instructions of students.

This implies that without adequate functional tools, equipment, machines and consumables, it will be difficult to teach metalwork effectively. Having functional equipments contributes immensely towards the achievement of the objectives of technical educational programmes. However, Ogunsaju [1980] in recognition of the need for functional equipment and machine for effective performance of the technical education programmes, noted that for effective teaching and learning situations, school facilities and educational goals should be viewed as being closely interwoven and inter dependent. School facilities represent learning environment, which has a tremendous impact on the comfort, safety and performances of the students. Tools and equipment as aspect of tools and equipment set the stage for the learning situation that governs the relationship between the student and his/her teacher. Ogakwu (2004) noted that it will be difficult to carry out instructional activities efficiently and effectively without physical facilities and equipment.

The curriculum of technical education contains topics that cannot be taught without available functional facilities (tools, equipment, machines and consumables). Also in a workshop, where these tools are provided, teaching and learning could become a thing of pleasure to the students and instructors alike. Students can acquire skills that can make them saleable in the society. Asiabaka (2008) stated that the quality of the products bears a direct relationship with quality of the facilities deployed in the process of production Acquiring skills in technical training is one of the most essential activities of school workshop. Equipping a workshop in the contributions of Aina and Beecroft (1982) the provision could be accomplished through compliance to various recommendations by organizations that create standards.

The National Commission for Colleges of Education (1998) recommended a specified number of each of the tools, equipment and machinery for a specified number of students intended for admission in an academic year for technical education programmes in colleges of education. This implies that provision of functional equipment should be given consideration in the planning of course programme. Contributing, Agusiobo (1986) recommended proper planning which will give early consideration to the provision of tools and equipment. Non-use of adequate planning and tools and equipment in technical education workshops could be comparable to the informal type of tradeand skill training. There is need for use of adequate and functional tools and equipment in teaching and learning of technical education. AbdulKareem (2000) in his study of technical education in Kwara state asserted that consumables are exceptionally important in technical education training. He stated that in situation where consumable items are not provided, practicals may not be effective even if machines and equipment are in place. Regrettably, AbdulKareem stated that students are now expected to purchase these items and at time tools for workshop practice.

He further observed that some of the machines in the workshops and laboratories do not function because some part are not available to fix them up and so no practicals can be done. It may sound funny that some students do not come in contact with some simple machines throughout their stay in school only to be embarrassed when they get into industries. Uwaifo and Uwaifo (2009) corroborated this by stressing that the vocational and technical education programme in the colleges of education are not very effective in teacher preparation because of the gross inadequacy of facilities, equipment, instruments and machines. He stated that students are trained only on available facilities that are as absolute as age. As a result, Uwaifo and Uwaifo reported that what we turn out, as graduate in most of our NCE programmes are unskilled personnels who are adequately not governed with the A-z of the contents of the course one has chosen to study.

Akpan (1983) submitted that lack of tools, equipment and materials militate against effective technical education. Okorie (2000) stated that for the purpose of increasing the rate of skill development that tools and equipment for instruction must be made available to the teaching environment and this can only be achieved through effective management of these tools, equipment and machines. To this effect, Okoro (2006) presented a number of principles, which guided the administration of vocational education. These principles specified that there are minimum standards below which effective vocational education cannot be offered. The implication is that the environment of training should be a replica of the working environment. The number one of the principles, which related to the environment of technical education, states that; Effective establishment of process habits in any learner will be secured in proportion as the training is given on actual jobs and not as pseudo jobs. Principle number 16 states that; while every reasonable effort should be made to reduce per capital cost there is a minimum below which effective vocational education cannot be given, if the course does not permit of this minimum of per capital cost vocational education should not be attempted. The above review shows a combination of the importance of the environment to a learning situation and a perceived high incidence of inadequacy of tools and equipment. It then implies that any institution lacking in essential equipment and facilities cannot achieve the aim of a conducive environment required for effective technical education programme. This invariably, will affect effective teaching and student's acquisition of saleable skills.

## 2.6 Review of Empirical Study

Several research studies have been carried out on tools and equipment management.

Blessing (1997) carried out a study on resource management strategies in private secondary schools in Gboko Local Government Area of Benue State. The population of the study comprised of seven private schools in Gboko out of 14. Ten staff each were selected. Five

research questions were formulated to guide the study. A questionnaire, which was the main instrument of the study, was developed and administered to 70 of staff. Percentages and mean were used for data analysis. The result of the study showed among others that there is no proper management of school finance despite the fact that most of teachers are usually employed by these private schools are the low grade type. Also, the result indicates that the facilities provided in private schools in Gboko Local Government Area of Benue State are grossly inadequate particularly in area of provision of instructional materials and library facilities. This study relates to the present study in the area of tools and equipment management, it differs from this because it covers private school all resources in private school while this study focuses more on metal work tools and equipment in technical colleges.

Abimbola (2007) carried out a study on skill improvement needs of technical teachers for maintenance of workshop equipment in technical secondary schools in Ogun state, four research questions and two hypotheses were addressed. All population were used no sampling for technical teachers currently engaged in the teaching subject registered with NECO, WAEC and NABTEB in Ogun state. A survey questionnaire using mean, standard deviation and t-test were used in analyzing the data. The result shows that technical teachers did not acquire the skills required for the maintenance of workshop equipment during their re-service training, in addition lack of fund, lack of spare parts, lack of incentive to motivate technical teachers, lack of library facilities and poor maintenance culture. The inability of technical teachers in carrying out maintenance work in technical equipment in secondary schools, the result revealed work on technical teachers need skills, re-training on the maintenance of woodwork equipment. Hypotheses tested at 0.05 level showed the ineffective performance in secondary school level is not influenced by the number of years of experience and the certificate they possessed. Recommendations were made base on the findings of the

study, workshops or in-service training on the maintenance of the equipment for serving technical fund to buy spare parts and materials for maintenance of workshop equipment. The relationship between both studies is that they are both carried out on equipment management. The study differs from this study because it focuses more on the need for teachers to improve their skills on equipment improvement while this study deals with the technique needed for maintenance of tools and equipment for both the teachers and students.

Anaele and Ishaku (2008) conducted a research on workshop facilities management techniques adopted by technical staff in institutions offering technical teacher education programmes in North western Nigeria. Five research questions and three null hypotheses were formulated to guide the study. The population of the study consisted of 239 industrial technical education lecturers and workshop technicians. Structured questionnaire was used to elicit information for the study. Mean and standard deviation was used for data analysis. The findings of the study revealed among others, poor state of organization of workshop and facilities, adoption of improper technique of storing facilities etc. The study recommended that workshop facilities should be planned based on projected student enrolment. This work relates to the present study as both gears towards facilities management. The present study is not seeking for already adopted techniques, which might be wrong, instead it tries to find out technique for improving maintenance of these tools and equipment in technology college.

## 2.7 Summary of Related Literature

The most important factor in school effectiveness is the quality of teaching. Education however is for more than the sum of contributions of individual teachers. It demands good leadership and sound management, which have significant effect on students learning. Teaching of metalwork technology programme is hinged upon the acquisition of practical and applied skills. Skill acquisition can therefore be considered as the bedrock on which metalwork technology, it is noteworthy that skills cannot be effectively acquired if the tools

and equipment are poorly managed. This implies that the attainment of the objectives of metalwork technology depends to a large extent on effective management of tools and equipment.

Based on literature reviewed, it was revealed that effectiveness in teaching of metalwork technology requires giving the training in the same way, with the same operations, the same tools and the same equipment as in the occupation itself. The review of previous study revealed poor management of resources loss of tools and equipment and abandonment. It has also been found that workshops and facilities are poorly organized and that teachers adopt improper techniques in storing tools and equipment. The literature also showed that to give training and impart the required skills, that equipment and materials must be properly managed and effectively utilize and this from literature reviewed has not been efficient. This study therefore, intends to fill the gap by determining the management technique that will check against dearth of functional tools and equipment loss, vandalization and abandonment of tools and equipment in metalwork technology so that teaching – learning process will be enhanced and required skills acquired.

# CHAPTER THREE

## 3.0 METHODOLOGY

This chapter describes procedures used in the course of this study. It includes the research design, area of study, population, sample and sampling techniques, and instrument for data collection, validation of instrument and administration of instrument, method of data analysis and the decision rule.

### 3.1 Research Design

This study used a survey research design. According to Robson. (1993), a survey design is to answer question that have been raised, to solve problems that have been posed or observed, to assess needs and set goals, to determine whether or not specific objectives have been met, to establish baselines against which future comparisons can be made, to analyse trends across time, and generally, to describe what exists, in what amount, and in what context. The survey design is considered appropriate for this study because of the type of information needed. In support of this, Nworgu, (2001), stated that a research design is a plan or blueprint which specifies how data relating to a given problem should be collected and analysed.

## 3.2 Area of the Study

This study was conducted in Niger state. Niger State is in central Nigeria and the largest state in the country, The state capital is Minna and other major cities are Bida, Kotangora and Suleja. It has a land mass area of 76,363kmsquare with the GPS coordinate of 9.9309ºN 5.5983ºE and a total population of 3,954,772 people. The area to cover include all the technical colleges in the three (3) senatorial zones of Niger State.

## 3.3 Population of the study

Due to the distance between the location of the seven technical colleges in Niger state, there was limited time for the researcher to visit the whole technical colleges for the population of this study. Therefore, the targeted population for this study consists of 30 respondents, 20 metal work teachers and 10 instructors from technical colleges that were randomly selected in Niger State. Respondents from each technical college varies in numbers according to the numbers of metal work teachers available in each college.

## 3.4 Sampling

Five(5) technical colleges were sampled using simple random sampling technique from each technical colleges identified in the area of study. Simple random sampling technique was used to select teachers and instructors from the technical colleges for the study. A total of thirty respondents were therefore used as sample for the study

| S/NO | SCHOOLS | TEACHERS | INSTRUCTORS | TOTAL |
|---|---|---|---|---|
| 1 | Government technical college Eyagi, Bida | 5 | 2 | 4 |
| 2 | Government technical college Kotangora | 2 | 1 | 3 |
| 3 | Government technical college Minna | 3 | 2 | 6 |
| 4 | Government science technical college Suleja | 1 | 1 | 5 |
| 5 | Government technical college Shiroro | 4 | 2 | 4 |

| | | | | |
|---|---|---|---|---|
| 6 | Mamman Kotangora Technical College | 3 | 1 | 5 |
| 7 | Federal Science Technical College Shiroro Kuta | 2 | 1 | 3 |
| | | 20 | 10 | 30 |

### 3.4 Instrument for Data Collection

The instrument for data collection was a structured questionnaire developed by the researcher through extensive review of literature based on the research question posed for the study. The instrument consists of section A and B. Section A contain information about personal data of the respondent while section B contains three (3) research question. Research question 1 contain 10 items which deals with the planning strategies for maintenance of metalwork tools and equipment. Research question 2 contains 10 items which has to do with the organizing strategies for maintenance of metalwork tools and equipment. While research question 3 contains 10 items which deal with the coordinating strategies for maintenance of metalwork of tools and equipment.

All the items were responded to by using the following rating scale.

Strongly Agree (SA) 4 Points

Agree (A) 3 Points

Disagree (D) 2 Points

Strongly Disagree (SD 1 Point

#### 3.4.1 Validation of the Instrument

The instrument was validated by three experts in the Department of Industrial and Technology Education. Based on validator's suggestion, the instrument was corrected before

it was administered. This is to ensure the instrument is capable of giving necessary information needed for the study

### 3.4.2 Reliability of the Instrument

In order to ensure the internal consistency of the instrument, the researcher adopted test-retest technique. The instrument was pilot tested on 4 teachers and 3 instructors in Federal Science and Technical college Doma in Nassarawa State. Copies of the validated instrument were administered on the respondents. After three days, the same instrument was also administered to the same respondents and Pearson product moment correlation coefficient was used in establishing the stability of the instrument at 0.88 coefficient correlation. The responses of the teachers and instructors were analyzed using Statistical Package for Social Science (SPSS) Version 21.0.2

### 3.4.3 Administration of the Instrument

The instrument for the study was administered to the respondents by the researcher and two research assistant from location within the area selected for the study. The researcher briefed research assistant on the contents on how to interpret them to the respondents. All the questionnaires administered were retrieved at 100% rate.

## 3.5 Method of Data Analysis

Mean, standard deviation, and t-test statistic were used to analyse data. The data was computed using mean to measure the response of the respondents to research questions, while standard deviation and T-test was used to measure the level of significance for the hypothesis.

### 3.5.1 Decision Rule

The mean rating of 2.50 was used as decision point for every item. Consequently, any item with mean response of 2.50 and above is accepted while any item with a mean below 2.49 is rejected.

# CHAPTER FOUR

## 4.0 PRESENTATION OF DATA ANALYSIS

This chapter is concerned with the presentation of data analysis with respect to research questions posed for the study.

### 4.1 Research Question 1

**TABLE 4: 1. Mean Responses of the Respondents on the Planning Strategies in the maintenance and of tools and equipment in technical colleges?**

| S/N | STATEMENTS | 1 | 2 | *t* | REMARK |
|---|---|---|---|---|---|
| **1.** | Clean up of tools and equipment after every use | 2.96 | 2.40 | 2.68 | Agreed |
| **2.** | Scheduled maintenance of tools and equipment | 3.05 | 3.00 | 3.03 | Agreed |
| **3.** | Proper layout of equipment | 2.60 | 3.07 | 2.84 | Agreed |
| **4.** | Easy location of machines, switches and socket outlets for convenience and safety in metalwork workshop | 2.92 | 2.20 | 2.56 | Agreed |
| **5.** | Proper tools and materials examination necessary for the activities to be done in metalwork workshop | 2.40 | 2.96 | 2.68 | Agreed |
| **6.** | Proper schedule maintenance | 3.05 | 3.00 | 3.03 | Agreed |
| **7.** | Grouping of the learners based on work stations available in metalwork workshop | 3.14 | 3.10 | 3.12 | Agreed |
| **8.** | Adequacy in listing clearly the roles expected to be performed by the metal work technology teacher | 3.00 | 2.70 | 2.85 | Agreed |
| **9.** | Ability to state clearly the roles to be performed by the students in the lesson in metalwork workshop | 3.36 | 2.40 | 2.88 | Agreed |
| **10.** | Timely replacement of damaged tools | 3.00 | 2.89 | 2.95 | Agreed |

Key

N1 = Number of Teachers

N2 = Number of instructors

$_t$= Average mean of teachers and workshop instructors

$_1$ = Mean ofteachers

$_2$ = Mean of workshop instructors

The result presented in table 4.1 above shows that the respondents agreed with the items 1,2,3,4,5,6,7,8,9,10, with average mean score ranging from (2.56-3.12). This signifies that all the respondents agree to the planning strategies for proper management technique for improved maintenance of metalwork tools and equipment.

## 4.2 Research Question 2

**Table 4: 2. Responses of the Respondents on the organizing strategies for maintenance of tools and equipment in technical colleges?**

| S/N | STATEMENTS | $_1$ | $_2$ | $_t$ | REMARK |
|---|---|---|---|---|---|
| **1.** | Proper arrangement of equipment to facilitate teaching and learning of metal work technology | 3.07 | 2.90 | 2.99 | Agreed |
| **2.** | Equipment and tools should be organized based on uses and size for easy reference and accountability in metalwork workshop | 2.96 | 2.80 | 2.88 | Agreed |
| **3.** | Proper arrangement of tools and materials before and after use in metalwork workshop | 2.93 | 2.40 | 2.66 | Agreed |
| **4.** | Proper keeping of records of all the workshop equipment and tools | 3.07 | 2.30 | 2.69 | Agreed |
| **5.** | Tools and equipment in metalwork work shop should be organized or arranged so that supervisor can inspect and identify immediately worn out, broken and lost ones | 3.00 | 2.50 | 2.75 | Agreed |
| **6.** | Proper storing and securing of hazardous substances or materials in metalwork workshop | 3.23 | 2.40 | 2.82 | Agreed |
| **7.** | Consistent checking of tools and materials to avoid loss due to pilfering or vandalism | 3.36 | 2.20 | 2.78 | Agreed |
| **8.** | Tools and equipment in metalwork work shop should be used for activities they are designed for | 3.34 | 2.90 | 3.12 | Agreed |
| **9.** | Proper designation and equipping of work areas in metalwork workshop for each skill area such as maintenance, repairs, design and construction | 3.32 | 2.90 | 3.11 | Agreed |
| **10.** | Proper preventive maintenance on metal work trade facilities to avoid break down | 2.98 | 2.60 | 2.79 | Agreed |

The result presented in Table4. 2 shows that respondents agreed with items 1,2,3,4,5,6,7,8,9,10, with average means score ranging 2.66 to 3.12. This signifies that all the respondents agree to the organizing strategies for proper management technique for improved maintenance of metalwork tools and equipment

### 4.3 Research Question 3

**Table 4: 3. Responses of the Respondents on the coordinating strategies for the maintenance of tools and equipment in technical colleges?**

| S/N | STATEMENTS | 1 | 2 | *t* | REMARK |
|---|---|---|---|---|---|
| 1. | Grouping students to execute specific working projects in metalwork technology workshop | 3.25 | 3.20 | 3.23 | Agreed |
| 2. | Arrangement of workshop facilities available for different uses in metal workshop | 2.92 | 3.20 | 3.06 | Agreed |
| 3. | Periodic inventory and inspection of tools and equipment in metal workshop | 3.18 | 3.10 | 3.14 | Agreed |
| 4. | Allocation of materials and tools to groups or individuals for different use | 3.00 | 2.80 | 2.90 | Agreed |
| 5. | Unified efforts of individual students in metal workshop | 3.25 | 2.40 | 2.83 | Agreed |
| 6. | Interpreting and analyzing of different types of projects to the students individually and in groups in metal workshop | 3.07 | 2.30 | 2.69 | Agreed |
| 7. | Different tools and equipment should be harmoniously used in workshop operations | 3.36 | 2.40 | 2.88 | Agreed |
| 8. | Security arrangement in the metal workshop should include checking for pilfering of tools by both staff and students | 2.96 | 2.80 | 2.88 | Agreed |
| 9. | Improving the safety arrangement in the metal workshop by providing different safety devices | 3.32 | 2.30 | 2.81 | Agreed |
| 10. | Ensuring maintenance of different machines and equipment in the metal workshop | 3.05 | 2.80 | 2.93 | Agreed |

The result presented in table 4.3 shows that respondents agrees with items 1,2,3,4,5,6,7,8,9,10, with average mean score ranging 2.69 to 3.23. This signifies that all the respondents agree with the coordinating strategies for proper management technique for improved maintenance of metalwork of tools and equipment.

### 4.4 Hypothesis 1

Table 4.4: There is no significant difference between the mean responses of teachers and stakeholders of metalwork technology, on the planning strategies needed for management practice of tools and equipment

| S/N | STATEMENTS | $_1$ | $_2$ | S.D1 | S.D2 | t-cal | REMARK |
|---|---|---|---|---|---|---|---|
| **1.** | Clean up of tools and equipment after every use | 2.96 | 2.40 | 0.70 | 1.29 | 0.10 | NS |
| **2.** | Scheduled maintenance of tools and equipment | 3.05 | 3.00 | 0.82 | 1.19 | 0.01 | NS |
| **3.** | Proper layout of equipment | 2.60 | 3.07 | 1.20 | 0.81 | 0.09 | NS |
| **4.** | Easy location of machines, switches and socket outlets for convenience and safety in metalwork workshop | 2.92 | 2.20 | 0.87 | 1.17 | 0.12 | NS |
| **5.** | Proper tools and materials examination necessary for the activities to be done in metalwork workshop | 2.40 | 2.96 | 1.29 | 0.70 | 0.10 | NS |
| **6.** | Proper schedule maintenance | 3.05 | 3.00 | 0.95 | 1.00 | 0.01 | NS |
| **7.** | Grouping of the learners based on work stations available in metalwork workshop | 3.14 | 3.10 | 0.86 | 1.05 | 0.01 | NS |
| **8.** | Adequacy in listing clearly the roles expected to be performed by the metalwork technology teachers | 3.00 | 2.70 | 0.67 | 1.10 | 0.06 | NS |
| **9.** | Ability to state clearly the roles to be performed by the students in the lesson in metalwork workshop | 3.36 | 2.40 | 0.61 | 1.12 | 0.23 | NS |
| **10.** | Timely replacement of damaged tools | 3.00 | 2.89 | 1.00 | 0.74 | 0.02 | NS |

**Key**

S.D 1 = Standard deviation of teachers

S.D2 = Standard deviation of instructors

t-cal = T-calculated

$_2$ = Mean of instructors

t-critical = 1.96

NS= No significant

$_1$ = Mean of teachers

Teacher's N1=20

S = significant

Instructors N2=1

The analysis of table 4.4, shows that the T calculated value of each items does not equal or exceed the t-critical value of 1.96 necessary for rejection of hypothesis at 0.05 level of confidence. Hence hypothesis 1 was accepted, consequently there is no significant difference between the mean response of teachers and instructors regarding the planning strategies for proper management technique for improved maintenance of metalwork tools and equipment.

### 4.5 Hypothesis 2

**Table 4.5:** There is no significant difference between the mean responses of teachers and stakeholders of metalwork technology on the organizing strategies needed for management technique of tools and equipment.

| S/N | STATEMENTS | $_1$ | $_2$ | S.D1 | S.D2 | t-cal | REMARK |
|---|---|---|---|---|---|---|---|
| **1.** | Proper arrangement of equipment to facilitate teaching and learning of metalwork technology | 3.07 | 2.90 | 0.96 | 1.04 | 0.03 | NS |
| **2.** | Equipment and tools should be organized based on uses and size for easy reference and account ability in metalwork workshop | 2.96 | 2.80 | 0.70 | 1.17 | 0.03 | NS |
| **3.** | Proper arrangement of tools and materials before and after use in metalwork workshop | 2.93 | 2.40 | 0.87 | 1.29 | 0.09 | NS |
| **4.** | Proper keeping of records of all the workshop equipment and tools | 3.07 | 2.30 | 0.81 | 1.19 | 0.14 | NS |
| **5.** | Tools and equipment in metalwork workshop should be organized or arranged so that superv isor can inspect and identify immediately worn out, broken and lost ones | 3.00 | 2.50 | 0.95 | 1.03 | 0.09 | NS |
| **6.** | Proper storing and securing of hazardous subst ances or materials in metalwork workshop | 3.23 | 2.40 | 0.67 | 1.29 | 0.17 | NS |
| **7.** | Consistent checking of tools and materials to avoid loss due to pilfering or vandalism | 3.36 | 2.20 | 0.61 | 1.17 | 0.21 | NS |
| **8.** | Tools and equipment in metalwork workshop should be used for activities they are designed for | 3.34 | 2.90 | 0.67 | 0.95 | 0.11 | NS |
| **9.** | Proper designation and equipping of work areas in metalwork workshop for each skill area such as maintenance, repairs, design and construction | 3.32 | 2.90 | 0.63 | 1.14 | 0.10 | NS |
| **10.** | Proper preventive maintenance on metalwork trade facilities to avoid break down | 2.98 | 2.60 | 0.89 | 1.12 | 0.07 | NS |

The analysis of table 4.5 revealed that the T value of each items does not exceed the t-critical value of 1.96 required for rejection at 0.05 level of significant. Therefore hypothesis 2 was accepted, this indicate that there is no significant difference between the mean response of the respondents on the organizing strategies for proper management technique for improved maintenance of metalwork tools and equipment

### 4.6 Hypothesis 3

**Table 4.6:** There is no significant difference between the mean responses of teachers and stakeholders of metalwork technology on the coordinating strategies needed for management technique of tools and equipment.

| S/N | STATEMENTS | $_1$ | $_2$S.D1 | S.D2 | t-cal | REMARK |
|---|---|---|---|---|---|---|
| 1. | Grouping students to execute specific working projects in metalwork technology workshop | 3.25 | 3.20 | 0.71 | 0.98 | 0.01 NS |
| 2. | Arrangement of workshop facilities available for different uses in metal workshop | 2.92 | 3.20 | 0.87 | 0.98 | 0.05 NS |
| 3. | Periodic inventory and inspection of tools and equipment in metal workshop | 3.18 | 3.10 | 0.80 | 0.95 | 0.02 NS |
| 4. | Allocation of materials and tools to groups or individuals for different use | 3.00 | 2.80 | 0.95 | 0.98 | 0.04 NS |
| 5. | Unified efforts of individual students in metal workshop | 3.25 | 2.40 | 0.71 | 1.29 | 0.17 NS |
| 6. | Interpreting and analyzing of different types of projects to the students individually and in groups in metal workshop | 3.07 | 2.30 | 0.96 | 1.19 | 0.13 NS |
| 7. | Different tools and equipment should be harmoniously used in workshop operations | 3.36 | 2.40 | 0.61 | 1.29 | 0.22 NS |
| 8. | Security arrangement in the metal workshop should include checking for pilfering of tools by both staff and students | 2.96 | 2.80 | 0.70 | 0.98 | 0.03 NS |
| 9. | Improving the safety arrangement in the metal workshop by providing different safety devices | 3.32 | 2.30 | 0.67 | 1.19 | 0.22 NS |
| 10. | Ensuring maintenance of different machines and equipment in the metal workshop | 3.05 | 2.80 | 0.92 | 1.17 | 0.05 NS |

The analysis on table 4.6 shows that the calculated T value of each does not exceed the t-critical value of 1.96 necessary for rejection of hypothesis at 0.05 level of significant, hence hypothesis 3 was accepted. This means that there is no significant difference in the responses of the respondents on the coordinating strategies for proper management technique for improved maintenance of metalwork of tools and equipment.

**Discussion of Findings**

The findings of this study on planning strategies revealed that ten planning strategies are needed for proper management technique for improved maintenance of metalwork tools and equipment in technical colleges in Niger state. The planning strategies include clean-up of tools and equipment after every use, scheduled maintenance of tools and equipment, proper layout of equipment, easy location of machines, switches and socket outlets for convenience and safety in metalwork workshop and proper schedule maintenance. These findings were in agreement with the finding of Elom (2009) that proper planning for equipment based on metal work technology curriculum is one of the planning strategy for effective maintenance of metalwork tools and equipment

The findings of this study on organizing strategies revealed that ten organizing strategies are needed for proper management technique for improved maintenance of metalwork tools and equipment in technical colleges in Niger state. Among the strategies are proper arrangement of equipment to facilitate teaching and learning of metal work technology, equipment and tools should be organized based on uses and size for easy reference and accountability in metalwork workshop, proper arrangement of tools and materials before and after use in metalwork workshop, proper keeping of records of all the workshop equipment and tools and tools and equipment in metalwork workshop should be organized or arranged so that supervisor can inspect and identify immediately worn out, broken and lost ones. These

findings were in line with the opinion of Oranu (1994) that arranging the equipment and tools to facilitate proper maintenance of tools and equipment is an organizing technique.

The findings of this on coordinating study revealed that ten coordinating strategiesof proper management technique are needed for improved maintenance of metalwork of tools and equipment technical colleges in Niger state. These strategies include grouping students to execute specific working projects in metalwork technology workshop, arrangement of workshop facilities available for different uses in metal workshop, periodic inventory and inspection of tools and equipment in metal workshop, allocation of materials and tools to groups or individuals for different use and unified efforts of individual students in metal workshop. These findings were in consonance with the opinion of Asiabaka (2008) that carrying out inventory and inspection of tools and equipment in metal workshop periodically promotes effective maintenance in the workshop.

The hypothesis testing for the three hypotheses indicates that teachers and instructors do not differ significantly in each case. They had the same view regarding planning strategies for proper management technique for improved maintenance of metalwork tools and equipment, organizing strategies for proper management technique for improved maintenance of metalwork tools and equipment and coordinating strategies for proper management technique for improved maintenance of metalwork of tools and equipment in technical colleges in Niger State.

# CHAPTER FIVE

## 5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

### 5.1 Summary of the Study

Effective management for improved maintenance of tools and equipment is necessary in metal workshop or any workshop if effective teaching of the course is to be achieved. This is because it enables the teacher to effectively deliver his/her lesson to the students. It involves the planning, organization and coordinating of the workshop tools and equipment. Unfortunately, the management of tools and equipment in metal workshops by teachers in technical colleges of Niger State leaves a lot to be desired. The task of this study therefore is to identify the management technique for improved maintenance of metal work tools and equipment in technical college in Niger State.

The study used survey approach to identify the management technique for improved maintenance of metal work tools and equipment in technical college in Niger State. Thirty items were developed in the questionnaire to elicit instructors and teachers' responses and the questionnaires were validated by three lecturers in the Industrial and Technology Education Department. A total of 50 validated questionnaires were issued to the instructors and teachers: 10 and 40 respectively. The instrument data was analyzed using the SPSS software.

### 5.2 Implication of the Study

The findings of this study have implications for the Government, school administrators and the teachers of metalwork technology. The government and the administrators of technical colleges offering metal work technology will organize workshop and seminars based on identified tools and equipment management techniques needed for improved maintenance. The findings of this study have implication for metal work technology teachers in technical colleges. These teachers will develop themselves based on tools and equipment management

techniques identified for improved maintenance. The findings also have implication for metal work technology lecturers in tertiary institutions. The findings of the study will make them write textbooks on metal work technology tools and equipment management techniques.

### 5.3 Contribution to Knowledge

The study has been able to sheed light on the menagement technique for improval maintenances of metal work tools and equipment in technical collages and also in the development of competent teachers in metal work technology.

### 5.4 Conclusion

Observation reveals that eighty percent of Niger State metal work technology teachers do not employ management techniques in their instructions when teaching. This occurred as a result of lack of management techniques for tools and equipment by the teachers. This study was now conducted to identify management techniques. planning strategies for proper management technique for improved maintenance of metalwork tools and equipment, organizing strategies for proper management technique for improved maintenance of metalwork tools and equipment and coordinating strategies for proper management technique for improved maintenance of metalwork of tools and equipment

### 5.5 Recommendations

Based on the findings of the study and the conclusions made, the following recommendations were made:

1. All the techniques identified in the study should be packaged to retrain teachers of metal work technology through workshop or seminars

2. Competent teachers of metal work technology should be employed by government to teach in technical colleges in the State

3. Metal workshop of technical colleges in the state should be equipped with relevant modern machines and tools for the training of metal work technology students by the stakeholders

## 5.6 Suggestions for Further Research

The following related areas have been suggested for further research:

1. Workshop management techniques for improving teaching of metal work technology in technical colleges in Niger state

2. Workshop management techniques for improving teaching of metal work technology in colleges of education or polytechnics in Nigeria

3. Capacity building needs of teachers for effective teaching of metal work technology to students in technical colleges in Niger State.

## REFERENCES


Abdulkadir J. B. (2011). The essence for resource management in vocational technical education in a democratic setting. Proceeding of the Nigerian Association of Technology Teachers (NATT). Annual National Conference, Oyo, 120-132.

Adabo, A. O. (2009). Infrastructure facilities management and functional higher education in Nigeria. *Journal of Education Research and Development (JERD) 1(I): 46-52.*

Adebesin P. M. (2003). The need for provision of facilities and good Management of Vocational and Technical Education in Nigeria. *Benue State University Journal of Education, 5, 161-168.*

Abimbola, P. A. (2007, February). The present and future of vocational technical education in Nassarawa State. Paper Presented at NATT Annual Conference, Nassaraa State.

Ahmad (2010). Planning Schools Workshops for Effective Practical Instructions as a Tool Towards Sustainable Development in Nigeria. *Nigeria Vocational Journal, 14, 1-6.*

Aienbinz, S. O. (1993). Essential of educational management. Makurdi: Jalim Press Ltd

Akpan, D. K. (1983). Principles and practices of Technology Education in Nigeria. Enugu: Floxtones Press.

Aina J. O. Beechft S. I. (1982). Enhancement effective implementation of technology education in a democratic Nigerian educational system. *Nigeria Association of Technology Teachers Journal. Annual National Conference, Oyo, 30-36.*

Agusiobo, F. A. (1986). Vocational technology education and work skill requirements in contemporary Nigeria: the way forward in electrical technology education. Proceedings of the Annual National Conference of Nigeria association of Teachers of Technology. Uyo, 152-161.

Akinsehimoain, P. A. (2003). Evaluation of practical utilisation of introductory technology equipments in junior secondary schools in Abuja municipal area council. Unpublished B.Ed. Thesis. VTE Dept. UNN.

Akpakwu N. F. (2003). Educational and training needs of low-level agricultural craftsman for teaching in the universla basic education programme in Anambra state. Unpublished PhD Thesis, University of Nigeria, Nsukka.

Anade E. A. Isiaku O. (2008). Promotion of safety practices in business and technical practical education workshop and laboratories. Journal of Business and Office Education. 1(2).

Asia B. O. (2008). The benefits of universal basic education (UBE) over present schooling. *Journal of Nigeria Education Research Association 14(1): 205-208.*

Asilokun, B. A. (2003). Strategies for the improvement of students performance in technical subjects in democratic Nigeria. Proceedings of the National Association of Technology Teachers (NATT). Annual National Conference, Oyo,160-168.

Carlson, U. (1982). Identification of Workshop Organization and management Techniques for improved teaching and learning in selected schools in Kaduna State. Unpublished M.Ed. Thesis. Department of Vocational Teacher Education, University of Nigeria, Nsukka.

Certo, A. O. (1982). Workshop management techniques for improving the teaching of introductory technology under the UBE programme in Nassarawa state. Unpublished master's thesis, University of Nigeria, Nsukka.

Chukwuoni, A. O. (1989). Workshop Management Techniques for improving the teaching of introductory technology under the Nigeria vision 2020 plan in Nasarawa state. A paper presented at Annual National Conference of Nigeria Association of Teachers of Technology.

Davis, E. O. (2007). Workshop management techniques needed for improving the performance of metalwork teachers in technical colleges in Abia and Enugu States. Technical and vocational education Journal, 1-14.

Elom, E. N. (2009). Strategies for planning facilities for the metal workshop. Ebongi technology and vocational Education Journal, 1, 60-64.

Eyibe O. P. (1998) Guidance and Counseling in Education. Nsukka, Chubson International Press Bookshop Complex University of Nigeria.

Fenker O. A. (2004). A guide to preparing educational specification for secondary industrial arts facilities, Unpublished Lecture Notes. U.N.N.

Menamara, O. T. (2008). Perceived roles of technical teachers in the maintenance of workshop equipment in Anambra and Enugu States. Unpublished Ph.D Thesis. Department of Vocational Education, University of Nigeria, Nsukka.

Nwando U. J. (2006). Skills improvement needs by introductory teachers for effective management of schools in Imo state. Unpublished master's thesis, University of Nigeria, Nsukka.

Nwaugu S. B. (1985). The genesis of the construction industry in Lagos. Ibadan: Longman Publishers.

Nwochwawa, M. O. (2006). The impact of the equipment maintenance project on workshops of polytechnics in South-East Zone of Nigeria. Unpublished Ph.D Thesis. Department of Vocational Education, University of Nigeria, Nsukka.

Obede I. Ogbonnaya (1997). Principles and applications of education policies in Nigeria. Nsukka: University Trust Publishers (UTP).

Obi C. E. (2003). Designing appreciate methodology in vocational and technical education for Nigeria: Nsukka: Fulladu Publishing Company.

Odor, F. C. (1995). Education planning in Nigeria: Issues and concepts. Ogbudu: Techsourcepeb. Nigeria Ltd

Odubunmi, K. C. (1993). Management in education. Ogbudu: TechsourcePeb. Nigeria Ltd

Odigbo, T. C. (1999). Development of a system for the Maintenance of Technical Laboratory Equipment. Unpublished PhD thesis, Department of Vocational Teacher Education University of Nigeria Nsukka.

Ogunsaju. S. (1980). School management and supervision. Ilorin: Crystal Press.

Ogwo, B. A. (2004). Workshop administration and management. Unpublished manuscript, University of Nigeria, Nsukka.

Ogwo, B. A. &Oranu, R.N (2006). Methodology in formal and non-formal technical/vocational education. Nsukka: University of Nigeria Press Ltd.

Okafor, G. G. (2007). Promoting quality assurance in technical education programmeNigera. A Paper Presented at the Seminar Organized by the school of Technical education, federal college of education, Akoka.

Okorie, J. U. (2002). Developing Nigeria's Work force. Calabar: page environs Publishers.

Okoro M. O. (1993). Principles and methods in vocational and technical education. Nsukka: University Trust Publishers.

Olaitan, S. O. (1999). Vocational and Technical education in Nigeria: Issues and Analysis. Onitsha: Noble Graphic Press.

Onwunali C. C. (2003). A study of management and organization problems in introductory technology in Abia State. Unpublished B.Ed. Thesis VTE Dept. UNN.

Onyemachi, and Ekay (1999) Foundation of Vocational Education. New Direction and Approaches. Benin City: Suppreme Ideal Publisher International Pages 118-131

Orami, R. N. (1994). Issues in the management of public schools. *Journal of Educational Research and Development (JERD) 1(1): 67 – 72.*

Robon, O. J. (1993). Strategies for Managing Vocational and Technical resources. *Benue state University Journal of Education, 5 127-135*

Samuel R. C. (2007). Selected management techniques of introductory technology. Unpublished B.Ed. (Tech) Project, UNN.

Simpsun, A. O. (1981). Workshop Management Competencies needed by the introductory technology teachers in Edo state. Unpublished M.Ed. Thesis. Department of Vocational Teacher Education, University of Nigeria, Nsukka.

Tarig, S. (2008). Evaluation of instructional programmes in vocational/ technical education In

Uzoagula B. (1993). Identification of workshop organization and management techniques for improved techniques/learning in selected secondary schools in Kaduna state. Unpublished M.Ed. thesis, VTE Dept. UNN.

Wang H. I. (1993). Management A global perceptive. New Delhi: Mc Graw hill Publisher.

## APPENDIX A

**FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA.**

**DEPARTMENT OF INDUTRIAL AND TECHNOLOGY EDUCATION**

MANAGEMENT PRACTICE OF METALWORK STAKEHOLDER IN THE MAINTENANCE OF METALWORK TOOLS AND EQUIPMENT IN TECHNICAL COLLEGE IN NIGER STATE

**INSTRUCTIONS**

This questionnaire was design to assist the researcher in getting relevant information from you on the above subject matter. Kindly provide the necessary information required by filling the space provided and tick (√ ) in section A and the appropriate column for section B, C, D. The information provided will be strictly use for the purpose of this research study.

Please note that the response option for section B-D are as follow:

Strongly Agree = SA

Agree = A

Disagree = D

Strongly Disagree = SD

**SECTION A**

Personal Data

Kindly tick (√ ) or write the response categories you think is most appropriate for the items below.

Name of institution……

Sex: Male ( ) Female ( )

Status: Teacher ( ) Student ( )

## SECTION B

(a) What are the planning strategies for proper management technique for improved maintenance of metalwork tools and equipment?

| S/N | STATEMENT | SA | A | D | SD |
|---|---|---|---|---|---|
| 1 | Clean up of tools and equipment after every use | | | | |
| 2 | Scheduled maintenance of tools and equipment | | | | |
| 3 | Proper layout of equipment | | | | |
| 4 | Easy location of machines, switches and socket outlets for convenience and safety in metalwork workshop | | | | |
| 5 | Proper tools and materials examination necessary for the activities to be done in metalwork workshop | | | | |
| 6 | Proper schedule maintenance | | | | |
| 7 | Grouping of the learners based on work stations available in metalwork workshop | | | | |
| 8 | Adequacy in listing clearly the roles expected to be performed by the metalwork technology teachers | | | | |
| 9 | Ability to state clearly the roles to be performed by the students in the lesson in metalwork workshop | | | | |
| 10 | Timely replacement of damaged tools | | | | |

(b) What are the organizing strategies for proper management technique for improved maintenance of metalwork tools and equipment?

| S/N | STATEMENT | SA | A | D | SD |
|---|---|---|---|---|---|
| 1 | Proper arrangement of equipment to facilitate teaching and learning of metalwork technology | | | | |
| 2 | Equipment and tools should be organized based on uses and size for easy reference and accountability in metalwork workshop | | | | |
| 3 | Proper arrangement of tools and materials before and after use in metalwork workshop | | | | |
| 4 | Proper keeping of records of all the workshop equipment and tools | | | | |
| 5 | Tools and equipment in metalwork workshop should be organized or arranged so that supervisor can inspect and identify immediately worn out, broken and lost ones | | | | |
| 6 | Proper storing and securing of hazardous substances or materials in metalwork workshop | | | | |
| 7 | Consistent checking of tools and materials to avoid loss due to pilfering or vandalism | | | | |
| 8 | Tools and equipment in metalwork workshop should be used for activities they are designed for | | | | |
| 9 | Proper designation and equipping of work areas in metalwork workshop for each skill area such as maintenance, repairs, design and construction | | | | |
| 10 | Proper preventive maintenance on metalwork trade facilities to avoid break down | | | | |

(c) What are the coordinating strategies for proper management technique for improved maintenance of metalwork of tools and equipment?

| S/N | STATEMENT | SA | A | D | SD |
|---|---|---|---|---|---|
| 1 | Grouping students to execute specific working projects in metalwork technology workshop | | | | |
| 2 | Arrangement of workshop facilities available for different uses in metal workshop | | | | |
| 3 | Periodic inventory and inspection of tools and equipment in metal workshop | | | | |
| 4 | Allocation of materials and tools to groups or individuals for different use | | | | |
| 5 | Unified efforts of individual students in metal workshop | | | | |
| 6 | Interpreting and analyzing of different types of projects to the students individually and in groups in metal workshop | | | | |
| 7 | Different tools and equipment should be harmoniously used in workshop operations | | | | |
| 8 | Security arrangement in the metal workshop should include checking for pilfering of tools by both staff and students | | | | |
| 9 | Improving the safety arrangement in the metal workshop by providing different safety devices | | | | |
| 10 | Ensuring maintenance of different machines and equipment in the metal workshop | | | | |