EFFECTS OF POWERPOINT PRESESNTATION ON THE PERFORMANCE OF SECONDARY SCHOOL STUDENTS IN METALWORK TECHNONLOGY IN ZARIA EDUCATION ZONE, KADUNA STATE

BY

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DECLARATION

I declared that the work in this thesis as entitled "Effects of Power Point Projector on the Performance of Secondary Schools Students in Metalwork Technology in Zaria Education Division, Kaduna State was carried out by me in the Department of Educational Foundation and Curriculum, Ahmad Bello University, Zaria. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this thesis was previously presented for another degree or diploma at this or any other institution

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Suleiman Abdullahi ADAMU **Date**

CERTIFICATION

This research work as titled "EFFECTS OF INSTRUCTIONAL POWER POINT PROJECTOR ON THE ACADEMIC PERFORMANCE OF SENIOR SECONDARY SCHOOLS STUDENTS IN METAL WORK TECHNONLOGY IN ZARIA EDUCATION DIVISION, KADUNA STATE" by Adamu Suleiman Abdullahi has been read and meets part of the regulations governing the award of the master degree (Instructional Technology) of the Ahmadu Bello University, Zaria and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

This thesis is dedicated to my Mother, Haj. Hajara Sulaiman for the prayers, encouragement, and support she gave me throughout the course of my study.

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ABSTRACT

This study investigated the effect of Powerpoint presentationon the academic performance of senior secondary school students in metalwork technology in Zaria, Kaduna State, Nigeria. The study objectives were three, with three research questions andthree null hypotheses which were tested. The study adapted pre-test post-test quasi-experimental and control group design. A total number of 200 students, from a population of 2115 SSIII metalwork technology students were selected using purposive sampling technique. Metalwork Academic Performance Test (MAPT), developed by the researcher and validated by experts was used for data collection. Research questions were answered using Mean and Standard Deviation, while t-test statistics were used in testing the hypotheses. The results revealed that, there is significant difference in the academic performance of metalwork technology Students exposed to Powerpoint presentation and those taught the same concept using lecture method only. Students taught metalwork technology using Powerpoint Presentation performed better than their counterparts taught the same concept using lecture method. The result further revealed that there is no significant difference in the performance of metalwork technology students in the rural and urban areas taught using PowerPoint Presentation. There is also no significant difference between males and females students taught metalwork technology using Powerpoint presentation as instructional media. Therefore, the use of PowerPoint Presentation is gender friendly. Based on the findings from this study, it was recommended that the use of PowerPoint Presentation in teaching metalwork technology in secondary schools should be encouraged by Federal and States Ministries of Education. It was also recommended that stakeholders in the education industry such as federal and state ministries of education across the nation should be exposed to training and retraining teachers on the use of PowerPoint Presentation by organizing periodic seminars, conferences and workshops for teachers of science and technology.

LIST OF TABLES

LIST OF FIGURE

LIST OF ABBREVIATIONS

The meanings of some abbreviations used in the research topic are presented below:

CD-ROM -	Compass Disc Read Only Memory
DLP-	Digital Light Processing
DVD-	Digital Visual Device
DVP-	Digital Video Projector
ERC-	Education Resource Centre
HD-	High Definition
IBM-	International Business Machine
ICT-	Information and Communication Technology
IMAA-	Instructional Material Accessibility Act
LCD-	Liquid Crystal Display
LED-	Light E Display
NPE-	National Policy on Education
NTI-	National Teachers Institute
MAPT-	Metalwork Academic Performance Test

OPERATIONAL DEFINITION OF TERMS

The operational definitions of some terms as they are used in the research study are presented below:

PowerPoint: This is computer software created by Microsoft which allows the user to create slides with recordings, narrations, transitions and other features in order to present information. It can also be defined as presentation software used for instructional purposes

Projector: Is an optical device that projects a beam of light which shows images, slides of information sang movies for instructions.

Utilization: This can be defined as the manner of using something in order to enhance instruction.

Academic performance: This can be defined as the total perception of concept by the learner which can be measured though test.

Metalwork: Is the manipulation of metals into useful components. It can also be defined as a process in which metals are made into useful things

TABLE OF CONTENTS

CHAPTER TWO: REVIEW OF RELATED LITERATURE

CHAPTER THREE: RESEARCH METHODOLOGY

CHAPTER FOUR: DATA ANALYSIS, RESULTS, AND DISCUSSION

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

One of the highest goals of education concerns improving students' ability to think critically, reason logically and ultimately solve problems (Tandi, 2009). PowerPoint presentations in the classrooms has significantly increased globally in recent years (Connor & Wong, 2004). Few evidences have systematically investigated its effects on students' learning and attitudes. One study that has examined the relationship between Powerpoint presentation and students' learning and attitudes was conducted by Butler and Mautz (1996). In a laboratory experiment conducted during a 30-minute time period, they found that Powerpoint presentation affects students' recall in all situations. They also found that there was interaction between the effects of the Powerpoint presentation and the student's preferred class presentation style (conventional method), (i.e., whether the student was considered a "verbal" or "imaginable"). They observed that students performed better when they use at least two of their senses; that is, senses of seeing and hearing.

Powerpoint presentation can be relevant in teaching school subjects. Supporting this view above, (Mayor, 2013) noted that an instruction delivery involving the use of VCD/DVD, power point projector or 16mm film, for example, is an instructional media presentation, in that, still pictures, motion picture background enhance students' understanding of concepts. In this approach, time keeping and coordination of different media are involved. It also includes the use of interactive element such as graphics, texts, videos and animation at the same time to deliver lesson. (Sambo, 2008). The use of

Powerpoint presentation in the delivery of instruction has experienced tremendous changes as a result of advancement in information and communication technology (Yusuf & Afolabi, 2010).

However, decades ago, worldwide communication and information technology was not so common in the third world countries. But nowadays, there is no doubt that modern communication technology has vastly increased our exposure to information and experience (Jolly, 2012). Most instructional media have implications for education that are only now beginning to be fully understood and appreciated. In fact, there is now the pervasiveness of mass media (Reiser& Dick, 2010). Powerpoint presentation has positive effect on young people. PowerPoint presentations are specially used by every intellectual institution and people of interest. It is really essential and necessary for the secondary schools to have adequate instructional media, since it constitutes a big and rare treasure in the development of the education sector.

Metalwork technology is defined as methods used by engineers, technicians and craftsmen to produce useful items by the use of Metals in the workshops. (Luthee,2009). Metalwork technology as processes such as welding, fabrication, forging and casting molten metal in metallurgical industries for the production of small and heavy duty components that are useful in our society (Adu,2011). Another defines metalwork technology as a process of manipulation of metals into useful components Ericsson (2012). Another author asserts that metalwork technology as a means of producing useful things in our society by the use of different kinds of metals (Cary H. 2013)

A comparison of the performance on standardized tests of students from small, usually rural, schools with those from larger, often urban, schools has not produced definite results. Several studies have not found any significant differences between the two groups. Monk & Haller (2006) found that students from smaller (often rural) schools achieved as well as students from larger schools. Kleinfeld (2005) did not find that high school size determine the quality of a student's education, experience or achievement on standardized tests. Ward and Murray (2008) looked at factors affecting academic performance of selected high school students and found that those attending schools in rural areas performed as well as those in urban areas. Also, Monk and Tien (2013) in their studies, failed to find any statistically significant differences between the two groups of students. Other scholars have found, however that rural-urban differences do exist. It is found that the ACT scores of rural students where two points lower than scores of urban students in each of the categories of ACT in Kansas (Downey,2009). Another examination of student's performance in Hawai public schools made by McCleery (1979) found substandard achievement to be a pattern in rural areas. In Nigeria, Adewale (2012) studied the effect of parasitic infections on school performance among school age children in Ilorin. He found that in rural community where nutritional status is relatively low and health problems are prevalent, children academic performance is greatly hindered.

Educational researchers have examined rural and urban differences in their academic performances. Many educators, researchers, legislators and the general public believed that students from rural schools mostly receive an education that is inferior compared to the students that live in urban areas. Students' background also has impact on their performance where we can see that many of the students that live in rural areas have low academic

achievement when we compared with their counterparts who are living in urban areas. There are many factors that caused the gap performance between students in rural and urban areas. Students in urban schools get access to educational facilities as compared to students in rural schools (Khan, 2011). The excellent performance of urban students is because of their better quality in their education, availability of the information that they get from various sources like mass media and electronic media, their educated families and peer groups which help them for better understanding of concepts. They have many advantages and facilities in their education compared to rural students who do not have the facilities. Students in rural areas are less- exposed to the outside world and also lack of knowledge about the currents issues that is happening. Education is proving to be an effective instrument that can raise students' self-belief, forethought, self-esteem and self-efficacy. Students that lives in undeveloped village must try to attain the best education for them and do not make their living environment as one of the factors that be a barrier in their success. One can see that students in rural areas are much less likely to earn a college degree than students of urban areas (Khan, 2011).

1.2 Statement of the Problem

The performance of senior secondary school students in SSCE in metalwork technology is not encouraging. Statistics obtained from Zaria Education Division, revealed a progressive decline in the performance of students in metalwork technology subject. For instance, a survey of performance of students from 2007 to 2016 who registered metalwork technology and sat for WAEC 30.7% success was recorded, as can be seen in appendix A.

2010 to 2013 in some Secondary Schools of Zaria Education Zone revealed that out of 310 students who registered for metalwork technology and sat for WAEC in 2010, only

37.9% of students pass at credit level. The situation is not different in 2011 with just 42.8%t. In 2012 the figure dwindled to 40.3% (Kaduna State Ministry of Education, 2013).

The poor performance is attributed to some factors which include lack of use of instructional media such as computer in conjunction with projectors, the use of conventional method in teaching metalwork technology, lack of encouragement from parent towards learning metalwork technology.

This prompted the researcher to assess the situation on the effects of PowepPoint presentation on students' academic performance in metalwork technology in senior secondary schools with particular reference to Zaria Education Zone Ministry of Education, Kaduna State. The researcher deliberately chose this category of institution bearing in mind that a lot of emphasis has been given to technology education at both federal and state levels of education. From all indications, students taught with real objects, power point presentation, models, charts, graphics in addition to the chalkboard, absorb more knowledge from demonstrations they see and exercises they do with the resources and understand better and faster than students whom were taught without the use of projector and other instructional materials, Owusu (2009).

1.3 Objectives of the Study

The objectives of this study are to:

1. Find out the difference in the academic performance of students taught metalwork technology with Powerpoint presentation and those taught with conventional method,

2. Examine the difference in the academic performance of urban and rural students taught metalwork technology with Powerpoint presentation and those who are taught with lecture method.
3. Ascertain the difference in the academic performance of male and female students exposed to Powerpoint presentation in learning metalwork technology.

1.4 Research Questions

1. What is the difference between the academic performances of students taught metalwork technology with Powerpoint presentation and those taught with lecture method?
2. What is the difference between the academic performance of urban and rural students taught metalwork technology with Powerpoint presentation?
3. What is the difference between the academic performance of male and female students exposed to Powerpoint presentation in learning metalwork technology?

1.5 Null Hypotheses

The following Hypotheses were formulated based on the research problems in order to guide the researcher.

1. There is no significant difference between the mean score of students taught metalwork technology with Powerpoint presentation and those taught using lecture method.
2. There is no significant difference between the performance of urban and rural students taught metalwork technology with Powerpoint presentation.

3. There is no significant difference between the academic performance of male and female students exposed to Powerpoint presentation in learning metalwork technology.

1.6 Basic Assumptions

In an attempt to investigate the effect of Powerpoint presentation on students' learning when learning metalwork technology in some selected secondary schools in Zaria Education Zonal Inspectorate Division, Kaduna State. The following assumptions were made.

i. Students who learn metalwork technology with Powerpoint presentation will perform better than those who are exposed to conventional method.

ii. The students in the study that were sampled have the same exposure to the metalwork technology concepts through conventional method of teaching but are not exposed to learning by the use of PowerPoint presentation.

iii. The use of instructional media like Powerpoint presentation in learning metalwork technology subject will by far improve students' performance, compared with conventional teaching method in both rural and urban secondary schools of Zaria Education Zonal Inspectorate Division, Kaduna State.

1.7 Significance of the Study

This research would be of benefit in the following ways.

The study is hoped that students' performance in the urban and rural areas improve when taught metalwork technology using Powerpoint presentation. Teachers who teach metalwork technology in senior secondary schools in Kaduna State would benefit from the research work for effective teaching and learning metalwork technology in their schools.

The study is also going to be of significance to curriculum designers to consider modern technology in the use of Powerpoint presentation in learning technical subjects. It is also going to be of significant to text book writers for the consideration of the use of Powerpoint presentation in writing their books in order to enhance learning and teaching process. The study would be significant to schools' administrators who are the supervisors of the academic activities and the administrators of teachers, learners and facilities in their respective schools. The research work would be of benefit to prospective researchers in the field of teaching and learning technical subjects. The study is also going to be of significance to Non-Governmental Organizations. The study is also help the NGOs to understand the importance of using Powerpoint presentation in teaching technical subjects in secondary schools for them to provide the schools with the facilities.

1.8 Scope of the Study

The study covered Senior Secondary Schools in Zaria Zonal Education. There are three local governments in Zaria Zonal Education. These are: Sabon Gari, Soba and Zaria Local Government areas. It also covers production of pig iron, types of iron ore, classification of metals and metalwork tools. The scope covers urban and rural areas, and both male and female in the study area.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter reviews related literature. It covers introduction, theoretical frame work, Powerpoint presentation, Powerpoint presentation utilization, Effects of PowerPoint presentation utilization, projectors, concept of students' academic performance, learning, metalwork technology, empirical study on PowerPoint presentation and summary of the chapter.

2.2 Theoretical Framework

This part of the study presents the review of some major variables of the study by various researchers over time. A theory is an explanation, idea or opinion based on thought, observation and reasoning which has been tested and confirmed as general principle explaining a large number of related facts (Yamah and Adoke,2012). It is stated that, a theory is an explanation, idea or opinion based on thoughts (Yamah, 2009). It can also be seen as an intellectual tool that does a number of functions which include helping us to analyze or organize our knowledge, guides the researchers in the formulation of priorities in the design of their research, enable us to apply the nature of scientific enquiry in an orderly manner, it enhances our ability of understanding of concepts and enables researcher to relate his area of study with fields of studies of others (Yamah, 2009).

The purpose of theoretical frame work in research is to provide a sort of a "pivot" on which the study rest, which will be a reference point to which the study must conform (Lawrence,2005).Greek philosophers, such as Socrates, Plato and Aristotle, (469-322 BC),

have carried out debates on how people learn. The debates that have occurred through the ages re-occur today in a variety of viewpoints about the purpose of education and how to encourage learning. To a substantial extent, the most effective strategy for learning depends on what kind of learning is desired and towards what end (Kadage, 2012).

This study adapted the cognitive theory of media learning and constructivism developed by Mayer, (2001), to serve as a pivot on which the study rests. Mayer's work is based on a learner–centered approach, which begins with an understanding of how human cognition works and focuses on the use of media to enhance human learning. Some of the key findings and techniques leading to effective practice and models that relates to the present study include: Spoken narration combine with an onscreen visual guide that does not split the attention of the learner, but in fact can enhance the experience in certain instances, sudden onset of pictures and animation is more effective for learning than static pictures alone, presumably by directing the learner's attention and focus to specific elements in the visual display and the sudden onset of having visual elements appear produces the same learning enhancements as an animated presentation. Thus, the procedure of flashing appropriate part of the pictorial information as they are described in the spoken narrative is as effective as a full animation. (Craig etal, 2002).

Many researchers have focused on how various design features relates to human information processing, such as comparing and testing designs that places a light and heavy loads on the learner's processing channel. An example of this can be seen in Pavio's work, (1986). He developed a human cognitive theory called "dual coding". Pavio made a case that the human brain is divided into two cognitive systems. One for processing non-verbal objects and information and two for processing language. The research conducted by Mayer

and Pavio provide a theoretical base for this study which seek to find out the effect of PowerPoint presentation utilization on student's academic performance when learning metalwork technology in some secondary schools in Zaria Education Zone.

Empiricism as pioneered by a great philosopher, Aristotle and other philosophers that followed his thoughts is strongly on the side of allowing learners to develop knowledge their senses and experiences under the guidance of a teacher. This is the trend and fashion in this technological era. Another theory is constructivist learning theory. Constructivism is a psychological theory of knowledge which argued that human construct knowledge and meaning from their experiences. Constructivism is not accepting what you are told but your prior knowledge about what you are taught and your perceptions about it (Tobin and Tippins, 2003).

Constructivism emphasized about active involvement of students, hence, knowledge gained last long in their memories. Constructivism is not a new concept it has its root in philosophy and had been applied to sociology and anthropology as well as cognitive psychology and education. Constructivism originated from the work of Dewey and moving forward to other theorists such as Piaget and Vygotsky. The basic premises of constructivism is that learners each have a unique knowledge base and rebuild that knowledge based on new information. Constructivism has three tenets that have relevance to media application in teaching and learning (Dauda, 2015). These tenets are: Each learner brings his/her own unique experience and knowledge set to the situation. The use of media in learning such as projectors allows the learners to pull from their own frame of references and apply them to the situation. Each learner has the potential to approach the situation in a number of ways they perceived the concept. Learning occurs through active exploration

when an individual's knowledge does not fit the current experience. The use of Powerpoint presentation in learning offers opportunity to push learners fast their current level of knowledge and see areas where education may be lacking improvement. Learning requires interaction within a social context. A fundamental function of inquiry and simulation games methods is a team approach to learning institutions. It was observed that whether it is a single or multi-disciplinary team in the simulation, effective interaction is often a requirement for success in media utilization in teaching and learning process (Rodgers, 2007)

Like many great scientific advances, Pavlovian conditioning (classical conditioning) was discovered accidentally. During the 1890s Russian physiologist Ivan Pavlov was looking at salivation in dogs in response to being fed, when he noticed that his dogs would begin to salivate whenever he entered the room, even when he was not bringing them food. At first this was something of a nuisance (not to mention messy!).Pavlov (1902) started from the idea that there are some things that a dog does not need to learn. For example, dogs don't learn to salivate whenever they see food. This reflex is 'hard wired' into the dog. In behaviorist terms, it is an unconditioned response (i.e. a stimulus-response connection that required no learning). In behaviorist terms, we write:

Unconditioned Stimulus (Food) >Unconditioned Response (Salivate)

Pavlov showed the existence of the unconditioned response by presenting a dog with a bowl of food and the measuring its salivary secretions. However, when Pavlov discovered that any object or event which the dogs learnt to associate with food (such as the lab

assistant) would trigger the same response, he realized that he had made an important scientific discovery. Accordingly, he devoted the rest of his career to studying this type of learning. Pavlov knew that somehow, the dogs in his lab had learned to associate food with his lab assistant. This must have been learned, because at one point the dogs did not do it, and there came a point where they started, so their behavior had changed. A change in behavior of this type must be the result of learning. (www.ccsenet.org/res)(retrieved 2015).

In view of the above, if students learn a particular concept with PowerPoint Presentation, using some of their senses such as hearing and seeing, the learning would be more effective than lecture method. Norton and Wiburg, (2003).Supports collaborative construction of knowledge through social practice, through the use of multimedia such as presentationwith projectors as PowerPoint which can be used for presenting reality to the learners. In many media combinations, the learners are provided with possibilities of individual perception freely on the concept presented. The use of media environment in which learners find themselves encourages the learner's individual experience of the world and freedom of choice of the media by which he/she most effectively learns.(Roncevic,2009).

Focusing on a more educational description of constructivism, meaning is intimately connected with experiences, (Mahoney, 2004). Mahoney (2004) observed that students come into classroom with their own experiences and cognitive structure based on those experiences. These preconceived structures are valid, invalid or incomplete. The learner will formulate his/her existing structures only if new information or experiences are connected to knowledge already in their memories. Inferences, elaborations and relationships between

old perceptions and new ideas must be personally drawn by the student in order for the new idea to be integrated with the useful part of his/her memory. Memorized facts or information that has not been connected with the learner's prior experiences will be quickly forgotten. For a meaningful learning to occur therefore, the learner must actively construct new information on to his/ her existing mental framework (Kadage, 2012).

The use of Powerpoint presentation for classroom instruction is highly interactive, rich, open-ended in terms of outcome, highly motivating and aided transfer and retention of the learned materials among the learners. The constructivist theories of learning support the pedagogy of participatory system of learning, where the learners will be allowed to actively participate in the learning process. Carlson, (2003), supports in strong terms on identifying, building upon and modifying the existing knowledge students bring to the classroom, rather than assuming they will automatically absorb and believe in what they read in the textbooks and are told in the classroom. Research conducted by Caprico, (2010) indicates that better examination grades are obtained by students who learn through constructivist methodology of which the use of projector as multimedia and learning environment shares some vital principles. Supporting Caprico's findings, Saigo& White, (2009), concludes that "the constructivist model has been found to slightly influence student's achievement in a positive way". The constructivist model is capable of getting students more involved in learning. Kurt and Somchai, (2004), in their own research study on constructivism also found that students used for their study participated more in the classroom activities and gained content knowledge when constructivist approach was used. Hence, the use of PowerPoint

presentation and utilization in learning metalwork technology is one of those constructivist approaches as its principles tallied.

2.2.1 An Overview of Instructional Media

Instructional media are gadgets that assist in deepening students' understanding of concepts. Conceptualized instructional media are aids which make it easier for the instructors to impart knowledge and skills to the learners (Egunjobi, 2009). The researcher stressed that instructional media and facilities save time, make learning more effective and promote interest for both instructor and the learners. Ricardo, (2008) viewed instructional media as tools used to supplement the written or spoken word in the transmission of knowledge, attitude and idea and to emphasize, clarify or vitalize the instruction. It was asserted that instructional media are electronics which can be used for the presentation of lecture notes, graphics and related core materials which are used by the teacher for classroom instruction needed by a state or local education authority or agency, for use in secondary schools (Silver, 2010).

Instruction involving the use of specific media, requests the teachers knowledge on the usage of such media. He further lamented that teaching aids or instructional materials consist of carefully planned and selected resources to facilitate teaching leaning process, instructional materials are all the object, things, peoples used to promote the teaching and learning of metal work technology. The organized combination and utilization of media, materials, equipment and people facilitate the presentation of content for the realization of the stated objectives (Richert2008).

Although there had been discussions over different methods to teach Secondary School Students, lectures are not likely to stop being used. To emphasize particular points, many lecturer use written materials presented on a chalkboard, whiteboard or by transparencies on an overhead projector. In the last 10 years, another method of presenting visual information with lectures has gained prominence: projecting information directly from a computer onto a screen (PowerPoint presentations). In fact, many colleges and universities have rooms or mobile charts equipped with technology necessary for any instructor to display information in this manner. Furthermore, some administrators are pushing for instructors to use this technology (Carlson, 2002).

Powerpoint developed from a culture of slides within the business, government and military organizations, with the latter particularly fond of bullet phrases in documentation, long before the introduction of electronic presentations (Konrad, 2003). Powerpoint developed from a culture where the form of communication both horizontally and vertically within an organization began requiring interaction in different forms-the committee or office meeting changed as more and more meetings were introduced.

To facilitate various parts of the organization's tasks of meeting and transferring information, a presentation type format emerged, on the back of the "overhead projector." By 1975, fifty thousand overhead projectors were sold in the United States, and that number became more than one hundred twenty thousand by the mid-1980s (Parker, 2010). At the same time, 35 mm slides were playing a role in the display of visual display of information when working in a presentation format, but these were expensive and time consuming to say the least. The overhead allow the flexibility to quickly create a visual media, either with a

felt tip pen or typewrite/word processor acting to employ text. The culture of the overhead projector set the stage for the 1990s explosion in the use of Powerpoint.

In 1987 the first generation of Powerpoint was developed—named "Presenter" and designed for Windows 2.0. It ran on any Mac and used a floppy drive (Belleville: slide 3). 1988 ushered in the first Microsoft version of Powerpoint with its acquisition of the original producer, and by 1990 there was a Windows 3.0 compatible version on the market (Belleville, slide 5) (Tufte, 2003), Various iterations took the product to Powerpoint 97, and by that time Microsoft had the dominant market share with almost no competition. The proliferation of personal computers preinstalled with the typical Microsoft office suite encouraged and drove this monopolization of this program. Its accessibility has become one of the driving factors behind its liberal use. Earliest days, the earliest presentations were most likely battlefield plans drawn out in the sand to a staff charged with executing the battle. Military organizations are often more vertically stratified by function and rank than their civilian and even governmental counterparts, which lends itself to a culture in which one must prepare formally to brief up another the chain of command.

There are many theories aimed at supporting the learning and teaching process. For example, Paivio's Dual Coding Theory (1986, retrieved www. Learners attitude 2015), postulates that visual and verbal codes for representing information are used to organize incoming information into knowledge that can be acted upon, stored, and retrieved for subsequent use (Mayer 2005). Severin's Cue Summation Theory (1967, retrieved, 2016) states that learning is increased as the number of available stimuli is increased. The stimuli supplied through different channels have to be relevant to each other or the distraction would cause a decrease rather than an increase in learning and retention (Kaur et al. 2005).

The Atkinson-Shiffrin Model (1968, retrieved 2015) proposes a multi-store or multi-memory model for the structure of memory. It states that human memory is a sequence of three stages: sensory memory, short term memory, long term memory (Mayer, 2005). Baddeley's theory of Working Memory,(1986) suggests a model composed of three main components; the central executive, which acts as a supervisory system and controls the flow of information from and to its slave systems; the phonological loop, the visual-spatial sketchpad, and the episodic buffer, (Mayer, 2005).

The slave systems are short-term storage systems dedicated to a content domain (i.e., verbal and visual-spatial) (Mayer 2005). Sweller's Cognitive Load Theory (1988, retrieved 2015 www.waltar educational) refers to the load on working memory during problem solving, thinking and reasoning (including perception, memory, language, etc) (Kaur et al. 2005). Wittrock's Generative Learning Theory (2009) recommends less reliance on a professor's lectures while simultaneously creating more self-reliance among students (Mayer 2005). Mayer's Theory of Active Learning (SOI) states that one potential of multimedia learning is that teachers can utilize the power of visual and verbal forms of expression in order to promote student understanding, Figure 1 (Mayer 2005). Gagner's Information Processing Theory stipulates that there are several different types, or levels, of learning. The significance of these classifications is that each different type requires different types of instruction. Gagner identified five major categories of learning: verbal information, intellectual skills, cognitive strategies, motor skills and attitudes.

Different internal and external conditions are necessary for each type of learning (Kaur et al. 2005), (Mayer 2005). Constructivist theory states that: knowledge is constructed, not transmitted, prior knowledge impacts on the learning process, initial

understanding is local, not global and building useful knowledge structures requires effortful and purposeful activity (Moore 2000). Cognitivists' theory informs us that knowledge can be seen as schema or symbolic mental constructions, while the theory of behaviorism claims that learning is nothing more than the acquisition of new behavior (Moore, 2000).

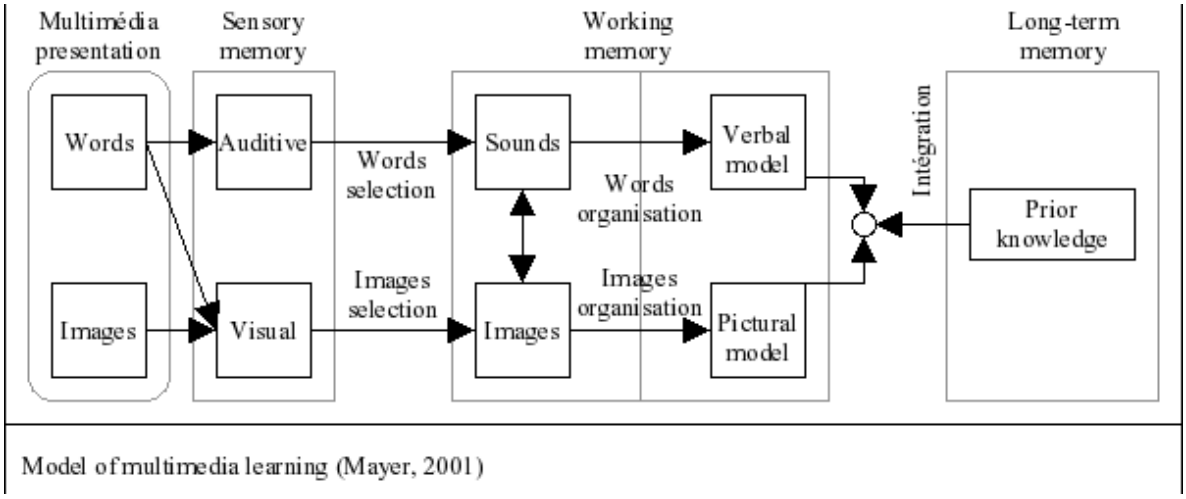

Figure 2.1 Model of multimedia learning (Mayer,2001)

Mayer's selecting-organizing-integrating (SOI) theory of active learning adopted from Mayer 2005.Seek and Richey (2004) states that media utilization is the systemic use of resource for learning. It is the backbone of any successful teaching and learning. Any teaching or learning that is devoid of instructional materials is bound to be in fiasco. A wise saying asserts that, "what I hear I forget, what I see I remember and what I do I understand."

It was declared that people generally remember 10% of what they read, 20% of what they hear, 30% of what they see, 50% of what they hear and see, 70% of what they say and 90% of what they say as they do a thing. Also, students remember 10% of what they read, 20% of what hear, 30% 0f what they see, 70% of what they say and 90% of what they hear,

say and do "(Kindler 2006) as quoted by Adeyoje J, (2012). Other scholars maintained that audio-visual materials like computers and projectors when properly used, supply concrete basis for conceptual thinking and have a high degree of interest for students, make learning more permanent and offer a reality and variety of experiences (Hagban,2010) and (Dela,2012). Another research was conducted on the effect of instructional television programmes on instructions and films on students' performance. As expected the findings shows a positive correlation between the use of these materials and student performance Hewkridge (2002) and Packman (2000). The National Council for Education Technology asserted that the use of computer in class room teaching had leads to a considerable increase in students' performance (N. C. E. T, 2007)

2.3 PowerPoint Presentation

The use of Powerpoint presentations for teaching has considerable potentials for encouraging more professional presentations. Powerpoint (© Microsoft Corp.) is a widely used presentation programme that originated in the world of business but has now become a common place in the world of educational technology. However, its use is far from controversial in this educational context and opinions as to its use range from highly supportive to significantly negative (Szabo & Hastings, 2000; Lowry, 2003). Powerpoint serves as a genre of communication relying primarily upon the visual as a medium for transmitting information. With Powerpoint images and words clumsily fall together to act in the role of signifiers. In the use of Powerpoint we are relying on the display, the presenter, and the viewer, and consequentially it dominates through its use of the visual in the presentation of evidence. Powerpoint is a way, when properly used, can be an effective tool

in creating what Roland Barthes described as mythology—mass media messages that deal with power and ideologies (Luke, 1989).

Powerpoint works so poorly and so well at the same time, it can be a horrible medium for the presentation of information, but at the same time in the hands of a skilled user it can be an excellent medium of pitching a sale (Tufte, 2003). The presenter can use simplicity and effects to present a one-sided ideological argument in the form of a sales pitch, in a style which squashes dissent and discourages discussion. At its basic level, these are the problems which Instructional Powerpoint can exemplify as it simplifies, skews reality and in some cases rewards theatrics over substance. The presentation itself becomes the reality, or more important than the actual facts and ideas to be debated. Critical thinking is not rewarded—a quick, one sided show is most presentable. It is this style of presentation which is the accepted norm of communication within government, military, and in many sectors of academia and business. Instructional PowerPoint, almost by design, forces the user into specific forms of presentation due to inherent characteristics and design functions. Its format supports relatively little information per slide, its statistical graphics hold marginal content, and in most cases encourages a bullet style presentation of ideas (Allan 2013).

2.3.1 Instructional PowerPoint Utilization

The use of Powerpoint presentation in education systems directly from one of its most favorable features, namely the ease of use and the relatively shallow learning-curve required to achieve basic-level usage. (Allan and Jones 2003) assert that the benefits of using PowerPoint presentation, when appropriately used, far outweigh the

potential negatives for both staff and students and that it offers an excellent and powerful tool to facilitate the improved delivery of many courses and modules. They stated some good reasons why teachers should use Powerpoint in the delivery of their instructions. These reasons are: appropriate use of Powerpoint can enhance the teaching and learning experience for both staff and students. It provides encouragement and support to staff by facilitating the structuring of a presentation in a professional manner. The templates provided have been designed to default to good presentation criteria such as the number of lines of information per slide and appropriate font sizes and types, and so on, using the styles of the default templates can significantly improve the clarity and structuring of a presentation. This helps to avoid the common use of excessive text often found on overhead transparencies.(Allan & Jones, 2003)

By careful mixing of media, a presentation can appeal to a number of different learning styles and be made more stimulating. You are encouraged to incorporate more sophisticated visual and auditory media into presentations although care is required because of the inevitable increase in file sizes and the danger of excessive use. Incorporation can be done, either directly from within the programme or, sometimes more successfully, by appropriate pausing of the Powerpoint presentation and using alternative technology(e.g. tape player or VCR). Note that this does not require switching off either the computer system or the projector system, one of the most common perceptions that restrict use – instead, use the 'B' character toggle switch during a slide presentation to 'blank' the screen temporarily while using other media.(Jones 2003).

The electronic file format allows distribution and modification for students who are unable to be present or who have impaired visual or auditory difficulties.PowerPoint comes

with a free viewer programme that can be distributed with the files so that the reader is not required to have PowerPoint on their personal system. However, if they do have it, they are able to perform greater variety of manipulations on the PowerPoint file provided, such as editing the text and so on before printing it out. Most Virtual Learning Environments (VLEs) are now capable of including Instructional PowerPoint presentations if required.(Allan, 2003)

Editing of each PowerPoint file is very easy with minimal associated reprinting costs. This ease and potential immediacy of revision facilitates reflection upon, and evolution of, teaching materials by staff whilst minimizing the consequences of any revision in terms of either workload or time. This was a major reason for my own extensive switch of teaching materials to PowerPoint, even when the end-product was required to be an overhead projection slide. I also find that I can add a new slide whilst in a lecture if so required: I often use this method to present notices or create a record of the outcome when collecting information from the class so that it can subsequently be made available to the entire class (Allan 2003).

He further said, printing of handouts in a variety of formats is facilitated with a number of embedded options to print either the slides themselves (useful if there are graphics involved) or the text from the slides. The outlines may be saved as a format and opened for further modification within an appropriate word processor. This allows the easy development of more sophisticated handouts based on the Powerpoint presentation but with extra interactive elements such as readings and questions added where appropriate.

Extra information can be ‘hidden’ within files for answering predicted questions or for providing feedback to students using the file in a distance learning context. The use of

speaker notes as an automated feedback system was described by Mottley (2003), who also describes other ways to use Powerpoint for development of self-study materials. The portability of the files, especially on compact disks (CDs) with their large capacity, allows presentations to be given wherever the technology is available or distributed where appropriate. Presentations can also be set up to run automatically if required example as demonstrations/instructions within a laboratory. Computers ease instructional problems and can be exploited to enhance teaching and learning in all schools. This is an area where an array of promising technological and educational development is currently emerging (Wajiga, 2006).

Research indicate that ICT can change the teaching and it is especially useful in supporting student centered approaches to instruction, developing the higher order skills and promoting collaborative activities (Haddad, 2003). Recognizing the importance of ICT in teaching and learning, majority of the countries in the world have provided ICT teacher training in a variety of forms. Several efforts have been made by many countries to train teachers for effective use of computer as a tool for enhancing teaching and learning (Uko and Ebute, 2013). Ibrahim (2012) disclosed that computer is important in educational setting. The major importance include motivation, transformation of abstract idea to reality, facilitate understanding and comprehension of the subject matter and facts, address the needs of the users, thereby, making learners to learn on their own rate.

Supporting this fact, Yakar (2009) observed that, computer-assisted teaching do not only improve success but also develop higher level thinking abilities in students' learning. Chado (2013), said that teaching and learning of technical subjects especially Metalwork technology continue to suffer as a result of over dependence on lecture method alone. It is

essential technical education teachers devise other means by which knowledge and skills could be imparted to learners taking the advantage of modern technologies

2.3.2 Impact of Powerpoint Presentations on Student Learning

The evidence that Powerpoint presentations influence learning is largely anecdotal. Bryant and Hunton (2000), states that the degree of improved learning is a function of a complex set of interaction among learners and medium attributes. Mason and Hlynka,(2012), asserts that, Powerpoint presentation helps in structuring the content and processing of a lesson or lecture. Aiding note-taking and thus facilitating study is another purported advantage of using Powerpoint (Cook, 2008). Parks (2009), reports that students liked the lecture outline and graphs on the screen, and that the Powerpoint presentation had a positive influence on students. Harrison (2009), argues that PowerPoint enhances instruction and motivates students to learn. If this is true, the bigger question is, does PowerPoint help students learn? Powerpoint presentations incorporate graphics, animation, and color (imagery). Human information processing theories focus on how the human memory system gathers, transforms, compacts, elaborates, encodes, retrieves, and uses information. Sensory registers, short-term memory, and long-term memory are the three major storage structures of the human brain. The sensory system registers stimuli and holds them for a brief period until they are recognized or lost. Short-term memory, with its limited capacity, receives information from sensory registers. It holds information longer than the sensory registers through a rehearsal process, recycling the information again and again. Long-term memory is a permanent store of human knowledge, and receives information from both sensory registers and the short-term memory system (Moore et al., 2014).

Research has shown that attention plays an important role in determining when and how information is further processed from sensory registers to short and long-term memory. If information is not attended to, it is quickly lost in the sensory stimulus stage of processing. Reynolds and Baker (2011) finds that presenting materials on a computer increased attention and learning, and learning increased as attention increased. Human information processing theories can shed light on how PowerPoint features (graphics, animations, etc.) may influence learning. One of the theories is Paivio's dual coding theory of memory and cognition (Paivio 1986, retrieved 2015). This theory suggests that imagery and verbal systems are two subsystems of information processing. According to dual coding theory, the imagery system processes information about nonverbal objects, including images for shapes, pictures, models, animation, color, and sound.

While dual coding theory has implications for both short- and long-term memory encoding, according to Paivio (2000), "…the structural representations of dual coding theory relate to relatively stable long-term memory information corresponding to perceptually identifiable objects and activities, both verbal and nonverbal" (p.54). The general model of information processing assumes that encoding results in a memory trace, and that information can be encoded at a representational, referential, or associative level (Paivio, 2011). Information encoded at a representational level generates a short term memory trace, while information encoded at the referential level elicits both referentially-related verbal and nonverbal memory traces of a longer term nature. Associatively encoded information results in memory traces that include information about multiple verbal or nonverbal items (Paivio, 2011).

It is referential encoding that is most relevant for this study. The graphical nature of the Powerpoint presentation arouses students' imagery systems, which become more activated when information (instructional materials) is presented in non-verbal forms. PowerPoint presentations should arouse the imagery system and could contribute to comprehension, and improve short and long-term memory. Since, in a PowerPoint presentation, topics are presented in a hierarchical fashion with graphics, color, and animation, students could "use a mental image of that outline to study, to retrieve the information on a test, to organize their answer for an essay question, and to perform other educational tasks (Clark & Paivio, 2001)."

Rose, (2001) also notes that presentation of learning materials in graphical form is beneficial for students. Many studies have empirically tested dual coding theory (see Paivio, 2006 for review of dual coding theory). For example, relying on dual coding theory, Mayer and Anderson,(2010) compare the effect of presentations using words-with-pictures with those using words-before-pictures, on learning. They predicted that the words-with-picture group would outperform the words-before picture group because of referential connections between imagery and verbal representations. The results of their study support the prediction. Peek (2009) finds that when pictures and text are presented together, information retention is improved. Other studies have shown that color is a factor in memory representation. For example, Hanna and Remington (2011) find that color, as a stimulus, is a part of memory representation. Allen (2010) submits that colors are encoded as a verbal representation as well as in the perceptual mode in the form of a visual image. In a review of literature on the use of color in teaching, Dwyer and Lamberski (2013) concluded that

when color is central to the ideas and concepts being presented and the students pay attention, the use of color improves learning.

2.4 Concept of Students' Academic performance

Academic Performance is a measure of understanding of a concept, (Rutherford, 2012). Sesseac (2010) defined academic performance as the total understanding of a concept by the learner. Adamesu (2013) identifies academic performance of a leaner as the total perception of a concept by the learner which can be measured though test.

Research has been conducted on the performance of both rural and urban students when they are taught conventionally and the use of instructional media. For example, (Lather, 2011) said that there was no significant difference on the performance of rural students when they are taught metal work technology with motion pictures. Whereas the performance of students from urban areas improve significantly when they are taught with motion pictures. According to Kaduna State Ministry of Education (2013) the academic performance of students in science and technology in urban areas was 15% above the level of the performance of the students of the rural areas. Mathers (2013) asserts that, in an experiment conducted by Ruther and Williams for 50 students in senior secondary schools in metalwork technology, found that urban students performed better than the students from the rural areas. Mayor, (2009) indicated the indices for the performance of urban and rural students who were taught auto-mechanics by the use of computer projected on the overhead projector, found that students from the urban areas performed better (75%) than the students who comes from the rural areas (30%).

There is a difference in the relationship between attendance and academic performance among urban, semi-urban and rural schools. An increase in attendance score

will also increase academic performance as shown from the results of this study. Not surprisingly, like many other issues in education, the research comparing rural students with their metropolitan counterparts in educational outcomes in general, and in academic achievement in particular, has yielded inconsistent findings (Khattri, etal, 2007).

2.4.1 Differences between Rural and Urban Students

Recent educational research has examined rural and urban differences in their achievement. Many educators, researchers, legislators and the general public believe that students from rural schools mostly receive an education that is inferior compared to the students that live in urban areas (Adamesu, 2013). Students background also impact on their performance where we can see that many of the students that lives in rural areas has low academic achievement when we compared it with the students that lives in urban areas. There are many factors that cause to the gap performance between students in rural and urban areas. Students in urban schools get many excess compared to students in rural schools. The National Education Association said that the low performing youth are in public rural schools, (Harmer, 2006).

The excellent performance of urban students is because of their better quality in their education, availability of the information that they get from various sources like mass media and electronic media, their educated families and peer groups which help them for better performance. They have many advantages and facilities in their education compared to rural students. Students in rural areas less exposed to the outside world and also lack of knowledge about the currents issues that happen. Education is proving to be effective instrument that can raise students' self-belief, forethought, self-esteem and self-efficacy

Obemeata, (2011). Students that lives in undeveloped village must try to attain the best education for them and do not make their living environment as one of the factors that be a barrier in their success. Students in rural areas are much less likely to earn a college degree than students of urban areas (Obemeata2011).

2.4.2 Factors of Low Performance among Students in Rural Areas

There are many factors that contribute to the differences of performance between students in rural and urban areas.

At the rural areas, family is one of the factors that determine their child performance. In this study, students in rural areas have low performance compared to students in urban areas because it is relate to their parents education. Majority of parents in rural areas are less educated than parents in urban areas. The family background is the most important and weighty factor in determining the academic performance of learner. Harmer, (2006), survey found that, rural students felt no pressure to attain good performance when their parents' expectations towards education were low. Parental encouragement has a positive influence towards their child performance and at rural areas most of parents did not care about their child academic performance. Some experts believe that a parent expectation is the most influential factor affecting youth decisions to pursue education (Obemeata,2009).

The students' background relate to the low socioeconomic factor of their family also one of the factor that effect their performance in education. Most of the students that live in rural areas come from low income family. Their parents cannot provide them enough

educational resources at home. Compared to students at urban areas, majority of them come from high income families and their parents afford to send them to their tuition classes in order to get better performance. Urban students also can buy additional books for their references while for the rural students, they non-exposure to educational resources and it will affect their performance compared to those who have access to such resources. Students who have access to more resources are advantage compared to those from poor families because they can know more about the latest developments around them thus can assist them to improve their performance at schools (Obemeata, 2009).

Education promotes human capital as an asset that has greater or lower rates of return depend on the quality of education that is provided. Some of the factors that contributing to the poor performance are lack or resources and poor facilities in most schools especially in rural areas. Some of schools in rural areas are dilapidated compared to those in urban areas. The problem regarding unequal distribution of resources between provinces, rural and urban areas are still intact (Moronfola, 2008). Several schools in rural areas do not have laboratories and this situation means that students learn science by rote learning. Facilities are important in order to make the teaching and learning process more effective. Students that live in rural areas will less expose to the using of technology because the facilities that were provided for them are not sufficient. This will make their learning process will be less effective and they will have less knowledge about current issues as well as how to use technology. Students in urban areas have many advantages in their learning process and with the advent of technology it will make easier for their study. They will more understanding with their learning with the facilities provided.

Teacher is the important role in order to create good performance students. Most of the teacher did not want to posting in rural area because they think it will bring difficulty to them. So, the majority of teachers that were sent to the rural areas are the new teachers that have less experience in teaching. Obemeata, (1999) remarked that there is a direct relationship between the quality of teaching personnel and the quality of education process. Most of them did not master the teaching technique yet because they are still new in teaching area. When we compared to students in urban areas they usually have a teachers that have good communications skills in English. Most of teachers compete for placement in urban schools. So, rural school will have inadequate teacher and it will make their learning progress disturbed and not running properly.

2.4.3 Ways to address the achievement gap differences between rural and urban Students

In order to overcome the differences performance between students in rural and urban areas, several ways should be taken. Government has to play a role in improving educational outcomes for rural students. Government should provide enough facilities to the schools that located in rural areas same as the urban schools. Besides that, government also must provide a financial support to the students that lives in rural areas where we know that most of them come from low income families and not affordable to gain a better education and services. Facilities that were provided must be fair and equal treatment should be given to rural schools same like urban schools. In addition, best educators also should be placed in rural schools because they can help students to improve their performance. Good teachers will produce good students, (Obemeata, 1999). Most important is government should ensure that teachers are adequately qualified to teach the subject that allocated for them and they

can do their work properly. Education department also should visit all schools to establish and verify their needs to ensure that resources are allocated in line with their needs and state

While the teachers play their role at school, parents should play their roles at home. Although parents in rural areas have no education, they can help their children performance in terms of giving them moral supports and motivation to learn. Even they cannot help in terms of provide resources to learn, they can give a support to their child to study hard to change the fate of their family. Parents should realize how important of education to their child and their future. Parents can always ask their child about their learning progress and accompanied them during doing their work. They also must always care about their child performance and monitor their progress (Hawkridge, 2000).

The teacher is an important force in school learning. Teachers also one of the sources that can help in overcomes the problem of low performance among rural students. Teachers can help in encouraging the students to study hard and help them to complete most of their work at school during study time, where students can ask teachers if they do not understand about the lesson. If they are doing work at home, nobody can help them since their parents might not be able to assist because most of parents in rural areas have less education. Teachers should encourage their students to participate in many activities because it will give them the opportunity to build their self-confident and positive self-esteem. Besides that, teacher also can create a caring and supportive environment where students will feel more comfortable during their learning. Good relationship between students and teacher also good in order to improve students' performance where when

teachers are close with the students, students will feel easy and not shy to ask anything that they do not understand.(Khattrietal, 2007).

Harmer (2006) states that students should realize the importance of education in their future lives if they want a better life, they must study hard to get a good performance. Usually students at rural area does not care about their education and most of them dropout from schooling. This is because they do not have motivation in their study and their parents also did not care about their performance. So in order to overcome the gap performance between students in rural and urban areas, rural students should set their mind that education is important to change their lives. When they have a mindset that education is important, they will study hard in order to get a good achievement.

2.5 Learning

Many authors and scholars defined learning in different ways. Kundu andTutoo, (2004) defined learning as experience gained through modifications. Learning is considered as an active process and not a passive observation. Akinpelu, (2009), also defined learning as an activity carried out only by the learner; nobody can learn for another person, a person can learn without being taught. Learning according to Smith (2009) is the storage of information that can be reproduced. There is a link or an interaction between the learner and the environment during the learning process. During learning, experience is gained. Without learning all effort of learners and teachers are bound to become purposeless. Lefrançois, (2005) also describes learning as a change in human disposition or capability that persists over a period of time and is not simply ascribable to the process of growth. The kind of change called “learning” exhibits itself as a change in behaviour, and the inference of

learning is made by comparing what behaviour can be exhibited after such treatment. Learning is a process. It involves changes occurring over a relatively short period of time which enables the learner to respond more adequately to the situation. Thus, we learn to play the piano, we learn fractions, we learn to drive. On the other hand, we grow in intelligence and we grow in moral stature. In some cases, the factor of growth and learning will be so inextricably intertwined that either or both words will need to be used.

True learning produces changes in the conduct (behavioural pattern) of the learner. Every experience produces a change in the mental structure of the learner which in turn affects the conduct of the learner. This, in short, is the goal of learning (Kochhar, 2008). The ability to learn however differs from age to age and from individual to individual and that ability to learn involves not only intellectual capacity but also social, economic, perceptual, physical and psychological factors. Human beings learn through their senses. The ability to see, feel, hear, smell and taste therefore provides the means by which an interaction between man and his environment takes place.

Lowenfeld and Brittain (2002) also assert that the development of perceptual sensitivity should become a most important part of the education process. In their view, learning does not merely mean the accumulation of knowledge; it also implies an understanding of how the knowledge can be utilized. It can be deduced t hat learning is the process whereby new behaviour is acquired, strengthened or weakened as a result of experience gained in the form of either perception or behaviour. This means that learning is an active and not passive activity that depends on the learner. Learning is a personal

involvement, meaning the learner should be able and willing to assimilate the material being presented (Hawkridge, 2000)

Kyriacou (2009), observed that there are three central aspects to any consideration of student engagement in the activity of learning. These are attentiveness, receptiveness and appropriateness. He explained them further to say that, attentiveness are ways in which teachers can elicit and maintain a high level of student attention and concentration by varying the learning activities, getting students actively involved, and utilizing students' interests. Receptiveness depends in part on the ways in which teachers can make use of the different sources of students' motivation towards learning.

Appropriateness refers to the ways in which teachers need to match the learning experience to each student's current state of knowledge and understanding, and at the same time ensuring that the learning activities actually foster the desired educational outcomes. This implies monitoring of students' progress, presenting quick corrective feedback, structuring and presenting activities to facilitate meaningful learning, and ensuring that cognitive processes being fostered and demonstration of learning required are being appropriately assessed through questioning or tests. Without realizing it, we learn all kinds of things in all kinds of ways. Everybody learns different things in different ways. How one learns depends on what is to be learned. We learn how to ride a bicycle by doing (kinesthetic learning); make bread by kneading dough with the hands (tactile learning); to sing, play a musical instrument, or appreciate music by listening (auditory learning); and, learn about the movement of the stars and planets by observing (visual learning). Our senses bring all kinds of information to us (Farrant, 2006).

The fact that people learn in different ways implies that teachers should not expect students to be skillful in learning what they teach in the same way and also have the same abilities in all subjects. What needs to be recognized is that the very nature of teaching imbues the teacher with a background of experience that is quite different from that of the pupil. The circumstances make it necessary for the teacher to attempt to provide actual experiences that will make conceptualization and interpretation possible for the pupils. Where involvement with actual objects is unsafe, inconvenient or impractical, Farrant (2006) recommends power point projector as useful substitute for the actual experience. Since ability to interpret is crucial to effective communication, anything that helps students make meaning of words will create an understanding of the object of the lesson. The idea is that involvement of the learner in relevant experiences which appeal to the senses is a vital part of the communication process that results in greater interest, correct interpretation, clear understanding and retention of what is learned.

2.5.1 Learning with real object

Commenting on the importance of learning through real objects and situations, Opoku-Asare (2010) mentions the works of early philosophers like Rousseau, Herbart, Pestalozzi, Froebel and Comenius whose concern on children's education stressed the benefits of learning through their senses to make the subject of discussion more effective than in the absence of it. The implication is that pupils will remember what they see better than what they hear only and that more and better learning results from experiences gained through as many of the senses as possible. This gives credence to the Igbo (Nigerian)

proverb “what I am told, I forget; what I see, I remember; what I do, builds castles in my mind” (Nkuuhe, 2005).

The term “instructional media” according to Romiszowski (2008), refers to devices and materials employed in teaching and learning. He opined that the concept of media should be narrow enough to include only the media that is effectively used in teaching but broad enough “to include not only complex electronic communication media but also simpler devices such as slides, photographs, teacher-made diagrams and charts”. Furthermore (Opoku-Asare, 2004:36), said “that instructional media” includes hardware like blackboards, radio, television, tape recorders, video tapes and recorders and projectors; and, software like transparencies, films, slides, teacher-made diagrams, real objects, cartoons, models, maps and photographs. Similarly, Scanlan (2003) indicates that instructional media encompasses all the materials and physical means an instructor might use to implement instruction and facilitate students' achievement of instructional objectives. This may include traditional materials such as chalkboards, handouts, charts, slides, overheads, real objects, and videotape or film, as well newer materials and methods such as computers, DVDs, CD-ROMs, the Internet, and interactive video conferencing.

Instructional media are generally designed to provide realistic images and substitute experience to reach curriculum experiences. The media are considered the most efficient facilitators in the education set up. They are not substitutes for the teacher. Their use however, calls for an imaginative approach by the teacher who needs to constantly be on the alert for new ideas and techniques to make the lessons presented with different instructional media achieve effective outcomes ((Talabi,2001). Some devices are designed to present

information of kind that would not be available in an ordinary school experience. Examples include, films, television, sound recordings. Other types of instructional media have the function to help the pupil grasp the underlying structure of a phenomenon. Visual media are primarily for seeing, audio devices for hearing, and multi-sensory materials for use via two or more senses Talabi (2001). Instructional media are all devices and materials used in the teaching and learning process (Nkuuhe, 2005).

Instructional media are the various materials that appeal to the five senses- seeing, hearing, touching, feeling and tasting which enhance teaching and learning Nyame-Kwarteng (2006). Another scholar identifies instructional media as devices of hardware (equipment) and software (consumables) through which the learning process may be ensured and carried out. In other words, they are the collection of materials and equipment that can be used effectively for communication. These materials are used in the planning process of giving instruction. Instructional media with its various types affect different senses and act as an integral part of teaching and learning process, and thus helping to bring about meaningful experiences. In this study, instructional media refers to models, real objects and other materials in addition to the chalkboard and textbooks that are brought to the teaching and learning process to induce understanding of the learners (Ogunmilade 2004)

A large proportion of the literature reviewed showed that emphasis in science education is no longer on the transmission of factual knowledge (a characteristic feature of traditional method) but on teaching students how to learn a particular concept (Anderson, 1970 & 2010). The introduction of inquiry-based programme into schools prompted the teaching of science through inquiry approach. By this approach, students were expected to

acquire scientific knowledge through the scientific processes of observing, comparing, classifying, experimenting, communicating and inferring as they try to find out things for themselves.

2.6 Metalwork Technology

The use of metal in engineering technology can never be over emphasized. Metals are widely used in construction industries and in our day to day activities. (Harrison 2009) The tools we use in our workshops, cooking pots, spoons we use, the vehicles we drive etc are all made up from metals. The construction industries widely use metals to produce machines, machine parts and equipment for building and many other components that man use in his day to day activities (Carlus, 2011).

Modern metal working emphasizes the important place metals occupy in our everyday lives. It explores the numerous metal working career opportunities. It is designed to provide a broad experience in metal working through the use of tools, machines and materials that are basic to this important area (Aremu, 2009). According to Kirlar, (1999) metal work technology supplies basic instruction on tools, materials and procedures used in metal working occupation. It covers both hand and machine tool operations and supplies background knowledge on industrial equipment and processes. Metal work technology: This is the manipulation of metals for the production of useful components. Werker (2009) asserts that metalwork technology is the art of manipulating metals in to different use. Rutherford (2010) mentioned some of the processes employed in manipulating metals into useful components as Fittings, Machining, Fabrications and Welding.

Others assert that metals are used for many different purposes. It is used for the manufacture of items such as Jet and Rocket engines where the materials must withstand terrific heat. According to them, metals are used to make buckets for mammon earth movers where toughness is a must and modern air craft where light weight combined with great strength are required. Metals are used to make things of beauty such as jewelry, tableware, furniture and a combination of metals has the unique ability to convert sun light to electrical energy. (Adamesu & Johnson 2008),

2.7 Empirical Studies

Researchers have examined how helpful presentations with PowerPoint presentations through LCD are. Overall, research indicates that students prefer PowerPoint type presentations to presentations from transparencies. Uko and Ebute, (2013). Unfortunately, information on whether computer presentations improve student performance is much less clear. Several studies point to the idea that graphics improve students' recall, Szaba and Hastings, (2002). However, many courses that adopted PowerPoint presentations have not shown a corresponding increase in student performance. Szaba and Hastings (2000, Exp. 1). In fact one study demonstrated a decrease in students' performance when the instructor switched from transparencies to Power Point (Bartlett, Cheng & Strough, 2000).

One factor that this study did not investigate was the complexity of the multimedia presentations. For example, Power Point presentations can be as simple as having only text on a colored screen. It can also be complex with tables, pictures, graphs, sound effects, visual effects, video clips, etc. The effectiveness of PowerPoint and other presentations may

depend on the complexity of the presentation. In fact, several researchers have demonstrated that material such as irrelevant sounds, interesting but extraneous text and irrelevant pictures can reduce comprehension (Mayer, 2001).

It is also wise to consider advantages and disadvantages to the teacher when investigating the effectiveness of a new teaching method. In addition to the time needed to become familiar with creating computerized multimedia presentations, the effort needed to create and maintain multimedia presentations once the instructor is familiar with the software is important to examine. Bartsch and Cobern (2003),investigated the effectiveness of Powerpoint presentations in lectures, in their study, they tested whether using PowerPoint lectures (i.e., lectures that are supported by Powerpoint) would be liked more and would lead to better grades than using lectures supported by overhead transparencies. Furthermore, they assessed how much effort instructors would need to create PowerPoint presentations compared to transparencies. Since there were several different ways that Powerpoint could be used, they also compared different types of Powerpoint presentations.

There are three main findings from their study. First, there was disagreement whether students preferred PowerPoint presentations to presentations given with transparencies. Retrospective ratings indicated students preferred PowerPoint presentations. However, end-of-class ratings did not show any difference when comparing male and female students learning with PowerPoint presentation. It is unclear which measure is more valid. End of class ratings were immediate; however, since that analysis only included 11 classes, the analysis has low power. The end of term ratings indicated a difference, but

students may only be accurate in remembering how they felt at the time of the lecture (Bartche & Cobern, 2003).

The second main finding was that students believed that they learned more from both types of PowerPoint lectures than the lectures that used transparencies. There was agreement in both the end-of-class and retrospective ratings on this measure. Thirdly, some results indicate weaknesses with the expanded PowerPoint presentations. Specifically, expanded PowerPoint presentations take longer to create and, more distressingly, corresponded with lower average quiz scores. The first disadvantage in expanded PowerPoint presentations was not a surprise. From the instructor's experience, the majority of extra time was spent searching for relevant pictures on the World Wide Web (www) or through Clip Art files. This extra time allowed the instructor to place approximately seven pictures, graphs or tables into the presentation. Given that lectures will often be used, the extra time spent gathering materials would likely be considered reasonable to many faculty members (Aderson & Warger, 2009).

However, if the addition of non-text information into the lecture decreases comprehension, then the extra time should not be used. Therefore, it is important to determine whether non-text information does or does not help. The quizzes indicated that there was a significant drop in mastery of the material. However, there were several differences between the basic and expanded PowerPoint presentations. In the expanded PowerPoint presentations, both items that were relevant to the context were presented (e.g., most of the pictures), and items that were not relevant to the context were presented (e.g., most of the sound effects). One possibility is that irrelevant items detracted from the

learning and it was the irrelevant items that caused the decrease in performance. Other literature supports this hypothesis (Mayer, 2001).

For quite some time, a general perception of the comparative inferiority of rural `schools has prevailed. This view implies the existence of rural-urban differences in students' academic performance. The general perception of rural-urban differences also extended to many other socially desirable outcomes, such as aptitude, intelligence and aspiration (De Young & Lawrence, 2005; Herzog & Pittman,2009). Until recently, there has been little empirical evidence to challenge this view. Now, however, a growing body of work has begun to examine how well students perform in and after graduation from rural schools. Although the results are far from conclusive, they do suggest that some generally held beliefs about rural student achievement need review, if not revision. This concern about potential rural – urban differences in education outcomes is not limited to one country, but rather it appears to be a global issue.

The major reasons for the conjecture that students in rural areas receive an inferior education compared to their urban counterparts can be described as a deficit model of rural community and lifestyle. Although one may not be able to pinpoint the origin of this model, (Herzog & Pittman, 2009) provided insightful discussion about the major components that characterize the deficit model. In addition to the problem of societal bias and prejudice against ruralness, (Herzog and Pittman (2009) painted a somewhat bleak picture of major societal trends that have not been kind to rural communities and schools. They described demographic and economic trends as potentially damaging to rural schools migration out of the rural communities by young people and economic decline would not be expected to improve the quality of rural schooling.

Some factors could be responsible for the potential rural-urban differences. One of them could be availability of resources like books, computers, art and science supplies and course offerings. The availability of fewer resources in many rural schools than those in urban areas are often related to more limited curricula for these rural schools (DeYoung and Lawrence, Hall & Barker, 2005). Barker (2005) studied high schools and reported that smaller and rural high schools had significantly fewerart, data processing, calculus, psychology, sociology and advanced placement offerings. In Nigeria, rural schools may not have facilities to study subjects like Computer Science, Fine-Art, Music and French Language.

Another possible influence on hypothesized gaps in educational achievement between rural and urban populations is a long history of emigration by more educated people to urban areas in search of better job opportunities (DeYoung & Lawrence, 2005; Herzog & Pittman, 2009). Population loss contributes to the educational trend of school consolidation, although recent findings suggest that larger schools do not necessarily improve student performance (Haller et al, 2003; Plecki 2012). Herzog and Pittmen (2009) pointed out that school consolidation, partially supported by the conventional wisdom that bigger must mean better, has been the single most frequently implemented educational trend in the 20th century. Rural schools and their students may be the real casualties of this trend, as fewer students per school usually means less state funding allocated towards those schools, which in turn means fewer teachers, a sparser variety of course offerings, and less state-of-the art equipment and supplies.

Another factor could be that rural communities possess a much more limited view of existing occupational roles for rural youth, who then understandably restrict themselves

when going on the job market and on to higher education (Downey, 2010). It is attributed to low family expectations of rural students' career options. Such conclusions may be for the most part, supposition because opportunities presented on television may inform and intrigue (Brown 2005)

Van Djick and Kurtch (2001) opined that in the teaching and learning process, when the essential parts are used, effective and efficient learning occurs, students learn by doing or constant practicing, which in essence may lead to perfection. Teaching and guiding students, to make choices fast tracks the ability to take ownership of tasks, especially by the use of Powerpoint presentation in learning scientific and technological concepts.

2.8 Summary

The chapter discussed literatures related to the research study. It covers theoretical frame work, learning with power point projector, Powerppint presentation, PowerPoint presentation utilization, Effect of PowerPoint on students' learning, learning, concept of students' academic performance metal work technology and empirical studies.

PowerPoint in a way, when properly used, can be an effective tool in creating what Roland Barthes described as mythology—mass media messages that deal with power and ideologies (Luke, 1989).Many authors and scholars defined learning in different ways. Learning is defined as experience gained through modifications. Learning is considered as an active process and not a passive observation Kundu and Tutoo, (2004). Tutoo said that there was no significant difference on the performance of rural students when they are taught metal work technology with motion pictures whereas the performance of students from urban areas improved significantly. Several studies pointed to the idea that graphics improves

students' recall, Szaba and Hastings, (2002, Exp. 2). They said however, many courses that adopted PowerPoint presentations have not shown a corresponding increase in student performance. In fact one study demonstrated a decrease in students' performance when the instructor switched from transparencies to PowerPoint presentations (Bartlett, Cheng and Strough, 2000).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter dealt with Research design employed in the study, population, sample and sampling technique, research instrument, pilot study, validity and reliability of the instrument, procedures for data collection and procedures for data Analysis.

3.2 Research Design

The study adopted the use of $2 \times 2 \times 2$ factorial design that involved pre-test, post-test quasi-experimental and control group design to determine the effect of Powerpoint presentation utilization on Senior Secondary School Student's Performance in Metalwork technology in Zaria Education Zone. The researcher uses quasi-experimental design in order to ascertain the performance of students in the post-test experimental procedure. The scores of the experimental and control groups was correlated to establish students' performance. Detail of this design is represented in Figure 3.1

O_1 O_2

O_1 O_2

Fig.3.1Schematic Representation of Quasi-experimental Design

Key

O_1 - Pre-test
O_2 - Post-test

X_0 - Treatment X1 - Treatment

The results of the two tests are shown in appendix B.

3.3 Population of the Study

The population of this study consisted of 2115 Senior Secondary III students in 24 public Senior Secondary School in Zaria Educational Zone, Kaduna State. It consisted of males and female students. The distribution of the population is presented in appendix A.

3.4 Sample and Sampling Technique

Two hundred SSIII students formed the sample size of the study. The justification behind the choice of 200 students is supported by the central limit theorem which prescribed a minimum of 30 students as adequate enough to form a sample size in an experimental research (Sambo, 2008). A stratified sampling technique was adopted in selecting the sample of the study. This is because the schools were selected based on location and gender. A researcher is free to purposefully pick a sample based on its suitability to the study by possessing particular feature or character of interest. In this study, the variables of interest are gender and location. This is followed by balloting technique in which a child aged 10years was asked to randomly pick 4 folded papers from the two strata to get eight schools. To ensure selection of sample with equal abilities in terms of academic performance, the researcher pre-tested all the groups using Metalwork Academic Performance Test (MAPT). Detail of the sample size was presented in Table 3.1.

Table 3.1 Distribution of Sample size

Variable	Location	Male (M)	Female (F)	Total (T)
Experimental Group	Urban	25	25	50
	Rural	25	25	50
Control Group	Urban	25	25	50
	Rural	25	25	50
	Total	**100**	**100**	**200**

3.5 Instrumentation

The instrument for this study was tagged Metalwork Academic Performance Test (MAPT). The instrument was adapted from WAEC and NECO final year SSCE examinations. The items were selected from concept of production of metal which features annually in SSCE examination. The 20 questions adapted for this instrument was based on the topics which are hard to learn by the students in the metalwork technology curriculum of secondary schools. The items taken into consideration are the following topics taught to both experimental and control groups are, classification of metals and metalwork tools. The instrument used is 20 objective test items with three alternatives, A, B and C answers. Each objective item carries 3 marks totaling 60 marks.

3.6 Validity

The instrument was initially validated by WAEC and NECO as major examination bodies of the country. However, since the researcher selected the content of the items from two bodies and in different years, there was the need to further validate it to suit the present study. Therefore, the instruments were presented to three experts, two senior lecturers, in the

Department of Technical Education, Kaduna Polytechnic and a senior master who is teaching metalwork technology in Alhuda-huda College Zaria, for face and content validation. The suggestions that came from the professionals were considered to add quality to the instruments as they unanimously said the instrument MAPT was satisfactory.

3.7 Reliability

To establish reliability for the instrument, test re-test reliability method was employed. Two schools were randomly selected and twenty (20) students from each school were also purposely selected which are within the population of the study but are not part of the schools randomly selected for the research. The pilot schools are GSS Dinya representing rural areas and GSS Kofan Kuyambana representing urban areas.

After the pilot test, all the necessary corrections were made and items which were found not properly responded were modified. Students were taught for two weeks in order to assess the reliability of the instrument used. The test items contained appropriate instructions on how to answer the questions which were selected from metal work technology textbooks for senior secondary schools, and the pilot schools' standard grade was adopted for scoring. The pilot test involved administering PPPSAPT Test twice to a group of 40 students that formed an intact class in the school selected using test-retest method with two weeks interval. Pearson Product Moment Correlation Coefficient (PPMCC) was used to obtain reliability coefficient of the instrument. Sambo (2008).

The reliability co-efficient of the test re-test scores was computed by means of Pearson Product Moment Correlation Coefficient (PPMCC) and a reliability coefficient of 0.8was

obtained. This means that the test instrument is reliable. It also shows that the mean score performance in the post-test scores is slightly above that in the pre-test scores of the students.

3.8 Procedure for Data Collection

The procedure followed for the collection of data was that the researcher collected an introductory letter from the Department of Educational Foundations and Curriculum, Ahmadu Bello University, Zaria, which was addressed to the director of the Zone. The Zonal Director gave the researcher a hand written introductory letter to the principals of the schools I want to use for the research. This is followed by six weeks teaching period with PowerPoint presentation for the experimental group and lecture for the control group. Metalwork Academic Performance Test (MAPT) was used to determine the academic performance of the students as post-test. (Robert et al, 2003)

Before the commencement of the use of Metalwork Academic Performance Test (MAPT) on the experimental group, the study samples were pre-tested to find out their performance for the purpose of comparison. The study samples were then streamlined into two groups that is experimental and control groups.

Immediately after two weeks period, for the administration of MAPT on experimental group, the same MAPT were administered to control group in the usual paper and pencil test. The administration of the MAPT to both groups lasts for 45 minutes. The MAPT were scored by using a carefully prepared and validated marking scheme by expert in the Department of Educational Foundation and Curriculum, Faculty of Education, Ahmadu Bello University Zaria. The pre and post-test of each group was recorded on data sheet using the statistical package for sciences (SPSs) in order to find out the mean scores of each group. The mean differences for the

experimental and control groups were computed and compared using paired t-test statistical method for accepting or rejecting the hypothesis stated at 0.05 level of significance.

During the process for administration of the test, the MAPT items were distributed to the students and the students were allowed to read through the written instructions on how to answer the items of the test. Verbal explanation was done to the students on how to answer the questions. They were also allowed to ask questions for further clarifications. The samples spent 45 minutes to complete the test. Marking schemes was used as scoring guide.

3.9 Procedure for Data Analysis

The research questions 1-3 were answered using statistical inferences of Mean and Standard deviation. Thehypotheses were tested using t-test statistical tool 0.05 level of significance. This was because it is the most suitable inferential statistical tool which can determine whether significant difference exists or not.

CHAPTER FOUR

DATA ANALYSIS, RESULTS, AND DISCUSSION

4.1 Introduction

This chapter presents the analysis of data collected from the administration of pre-test and post-test using data were collected using Metal Academic Performance Test(MAPT). Descriptive statistics using mean and standard deviation were used to answer the three research questions. Data collected were analyzed with the aid of Analysis of Covariance (ANCOVA) at 0.05 alpha level of significance.

4.2 Analysis of Research Questions

The study was guided by the search for answers to the three (3) Research Questions raised in chapter One. These research questions are as follows:

Research question one.

What is the difference between the academic performance of students learning metalwork technology with Powerpoint presentation and those learning with conventional method?

Table 4.1:**Pre-test and Post-test Scores of Experimental and Control students of Metalwork technology.**

		Pre-Test		**Post-Test**		
Variable	N	Mean	SD	Mean	SD	Mean Diff.
Experimental	100	64.25	21.8	80.50	27.5	16.25
Control	100	57.32	15.0	69.28	20.9	12.26

Table 4.1 above showed the mean of and Standard Deviation of pre-test and post-test scores of all students in the experimental and control groups. From the result, it can be deduced that the mean score and standard deviation of the pre-test for the experimental group are 64.25 and 21.8 while the mean score and standard deviation of the same students in the post-test are 80.50 and 27.5. The mean difference was 16.25 in favour of the post-test scores. Similarly, the mean score and standard deviation of the pre-test for the control group are 57.32 and 15.0 while the mean score and standard deviation of the same students in the post-test are 69.28 and 20.9 respectively. The mean difference was 12.26 in favour of the post-test scores. This shows that metalwork technology students in the experimental group achieved higher scores than those in the control group.

Research Question Two

What is the difference between the academic performance of urban and rural students learning metalwork technology with PowerPoint Presentation?

The result is presented in Table 4.2

Table 4.2: Pre-test and Post-test Scores of Urban and Rural students taught Metalwork Technology with PowerPoint Presentation.

		Pre-Test		**Post-Test**		
Location	N	Mean	SD	Mean	SD	Mean Diff.
Urban	50	55.80	22.03	88.82	25.58	33.02
Rural	50	47.52	18.13	57.00	19.51	9.48

Table 4.2 indicated the mean and standard deviation of the academic performance of metalwork students of the experimental group in urban and rural areas. From the result, the mean of urban areas is 55.80 with standard deviation of 22.02, as against that of rural areas with a

mean of 47.52 and standard deviation of 18.13. There is slight difference of 33.02 in favor of the urban students. Similarly, the post-test result indicated that the mean for the Urban Group was 88.82 with standard deviation of 25.58. While the Rural Group mean score of the post-test was 57.00 with a standard deviation of 19.51 with mean difference of 9.48. However, this implies that Metalwork students exposed to Instructional PowerPoint presentation in the rural areas and that of the urban counterparts shows a significant difference.

4.2.1 Research Question Three

What is the difference between the Academic performance of male and female students exposed to Powerpoint presentation in learning metalwork technology?

Research Question three sought to examine the difference in the academic performance of male and female students of metalwork technology in the same group (experimental). The detail of the results is presented in Table 4.3 below.

Table 4.3: Mean and Standard Deviation of Academic performance Scores of Students with regards to gender the in Experimental Group

		Pre-Test		**Post-Test**		
Gender	N	Mean	SD	Mean	SD	Mean Diff.
Male	50	58.34	19.25	62.74	19.15	4.40
Female	50	56.02	16.77	60.18	19.05	4.16

The Table 4.3 revealed that the mean academic performance score of male students in Experimental group is 58.34, and standard deviation of 19.25 and mean difference of 4.40. While the Female students in the same group have a mean score of 56.02 with standard deviation of 16.77 and a mean difference of 4.16.Consequently, this implies that there is no significant

difference between the academic performance of female students exposed to Instructional PowerPoint presentation and their male counterparts.

Pre-test Result of Academic performance of students.

Table 4.4: t-test Analysis of Students' Pre-test Performance in Experimental and Control Groups

Groups	N	Mean	S.D	D	T	P.va	Decision
Experimental	100	64.25	21.8	198	1.12	0.04	Sig. di
Control	100	57.32	15.0				

Table 4.4 presented the pre-test result of students in experimental and control groups. From the result, experimental group recorded a mean of 64.25 while control group has a mean score of 57.32. The t-value observe is 1.12 and p-value is 0.04 which is less than alpha value which shows significant difference exist in the achievement of the two groups, the hypothesis is therefore rejected.

4.3 Null Hypotheses

Three research hypotheses raised in this study were tested and verified using inferential statistics as presented in Tables 4.7, 4.8, and 4.9 respectively.

4.3.1 Null Hypothesis One

H_{01}: There is no significant difference between the academic performance of senior secondary school students exposed to Powerpoint presentation(experimental group) and those who were not exposed to (control group).

In testing hypothesis one, data of post-test academic performance of the subject in experimental and control groups were used. Inferential statistics involving t-test statistics using statistical package of social sciences SPSS was employed in testing the hypothesis.

**** Table 4.5: t-test Analysis of Students' Post - test Performance in Experimental and Control Groups***

Groups	N	Mean	S.D	Df	t-cal	P.value	Decision
Experimental	100	80.50	27.5	198	26.14	0.00	Reject H_{o1}
Control	100	69.28	20.9				

Significant at $p \leq 0.05$

From Table 4.5 the experimental group had higher mean score (80.50+ 27.5) than the control group (69.28+20.9) which revealed significant difference,(198) =26.14,p=0.00/P,which indicated that the experimental group performance was significantly better than the control group. This mean a rejection of the hypothesis which state that there was no significant difference between the academic performance of senior secondary school students exposed to PowerPoint presentation(experimental group) and those who were not exposed to it (control group).

4.3.2 Null Hypothesis Two

H_{02}: There is no significant difference between the academic performance of senior secondary students exposed to Instructional PowerPoint presentation located in urban and rural areas.

Table 4.6: t-test Analysis of Students' Post-test performance by Location

Location	N	Mean	S.D	Df	t-cal	P	Remarks
Urban	50	55.80	22.03	98	0.73	0.47	Retained Ho2
Rural	50	47.52	18.13				

*not Significant at $p \geq 0.05$

Table 4.6 revealed that the mean score of urban students (55.80+22.03) which is higher than the score of the rural students (47.52+18.13) also revealed a significant difference between urban and rural students in favour of the urban students. Thus, the hypothesis which states that there is no significant difference between rural and urban students in their academic performances is hereby rejected with at (98) = 0.73, P = 0.47).

4.3.3 Null Hypothesis Three

H_{O3}: There is no significant difference between the academic performance of male and female students who are exposed to PowerPoint presentation utilization in learning metalwork technology.

Table 4.7: t-test Analysis of Post-test Academic Achievement Scores of male and female Students in the same group (experimental).

Group	N	Mean	S. D	df	t-cal	P	Decision
Male	50	58.34	19.25				
				198	1.27	0.21	Retain H_{O3}
Female	50	56.02	16.77				

*not Significant at $p \geq 0.05$ $t(98) = 1.21$, $p = 0.21$

From the result in table 4.7 above, it is observed that t-value of 1.27 is obtained and the p-value observed is 0.21 at the degree of freedom of 198. The p-value of 0.21 is greater than the alpha value of 0.05. This shows that there is no significant difference. Null hypothesis that stated that there is no significant difference between the academic performance of male and female students exposed to Powerpoint presentation utilization is retained.

4.4 Research Findings

From the result presented in this study, the summary of the major findings are:

1 .There is significant difference in the academic performance of metalwork technology Students in the experimental and control groups in favor of the experimental group.

2. There is no significant difference between the academic performance of senior secondary students exposed to Powerpoint presentation located in urban and rural areas.

3. There is no significant difference in the academic performance of male and female students exposed to Powerpoint presentationin learning metalwork technology.

4.5 Discussion of Findings

Findings revealed that learning using Powerpoint presentation enhances academic performance of metalwork technology students than conventional method of learning. This finding is supported by Davidson (1996), Receceand Walker (2001) and Wathore, (2012) who pointed out that the use of visual instructional resources such as projector enhances students' comprehension of concepts and performance.

The findings also revealed that there is no significant difference between the academic performance of senior secondary students exposed to Powerpoint presentation located in urban and rural areas. This research finding conform to other research findings of Monk and Haller (2006) that students from rural schools achieved as well as students from urban schools. In a similar vein, Alspaugh (2012), Snyder and West (2009), and Haller, Monk and Tien (2003) failed to find any statistical significant differences between the two groups of students. Conversely, Obemeata (2011) found that the urban secondary school students, having attended large schools were in more favourable situation than the other Nigerian children from rural environments.

The findings also revealed that there is no significant difference between the academic performance of male and female students exposed to Powerpoint presentation utilization. This research finding conformed to other research findings of Bartsch and Cobern (2003) which states that the end-of-class ratings did not show any significant difference when comparing male and female students learning with PowerPoint presentations.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter focused on Summary, Conclusion, and Recommendations on the research work as follows;

5.2 Summary

This study investigated the effect of Powerpoint presentation on the academic performance of senior secondary school students in learning metalwork technology subject in Zaria Education Zone, Kaduna State, Nigeria and presented in five chapters.

Chapter one of the research work presented the problem of the study. In the background of the study, the researcher was prompted by the persistent low performance of metalwork technology students in the final year SSCE Examination. The study has three objectives, one of which seeks to determine the effect of Powerpoint presentation on the academic performance of senior secondary school students in learning metalwork technology subject. The study is guided by three research questions and three hypotheses. The study was delimited to only SSIII metalwork technology students of public secondary schools in Zaria Education Zone, Kaduna state.

Chapter two of this study provided the introduction of the chapter, theoretical framework of the study, an overview of instructional media, PowerPoint presentation, effects of Powerpoint presentation on students' learning, the concept of students' academic performance; differences

between rural and urban students; factors affecting the performance of students in the rural areas; learning; metalwork technology; empirical studies and summary of the chapter.

Chapter three of this study presented the methodology of this study. The study adapted pre-test post-test quasi-experimental and control group design. Experimental group received experimental treatment using Powerpoint presentation while control group received it through conventional method. A sample size of 200 metalwork students were selected randomly from a quasi or true experiment with a population of 2115 SS III students for the study. Metal Academic Performance Test (MAPT) developed by the researcher and validated by experts guided in data collection. Mean and Standard deviation as well as t-test statistical inferences are the Procedures used for data analysis.

The chapter four of the study presented the result and discussion of findings. Three research questions raised were answered using Mean and Standard deviation while hypotheses testing involved the use of t-test at 0.05 level of significance using SPSS package. From the result of findings, it was confirmed that there is significant difference in the mean scores of the academic performance of metal work students exposed to Powerpoint presentation and those learn the same concept using conventional methods. Students in the experimental group performed better than control group. The results obtained further revealed that there is no significant difference in the performance of the students exposed to Powerpoint presentation in the rural and urban area. The result also confirmed no significant difference in the academic performance of urban and rural students exposed to PowerPoint presentation.

Chapter five of this study presented the summary, conclusion, and recommendation of the study. The study concluded that the use of PowerPoint presentations enhances academic

performance of students irrespective of location. The study recommended among others that the Kaduna State Ministry of Education should make provision of computers and projectors in secondary schools.

5.3 Conclusion

Based on the findings of this study, the following conclusions were drawn:

a) Students exposed to Powerpoint presentation performed better than those exposed to lecture method only.
b) Rural and urban Students taught metalwork technology using Powerpoint presentation did not differ significantly in their performance.
c) Experimental methods of teaching gender differ significantly in their performance in respect of time.

Finally, Powerpoint presentation improves the academic performance of senior secondary students in learning metalwork technology than lecture method irrespective of location or gender.

5.4 Recommendations

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

1. There is need for teachers to adopt the use of Powerpoint presentation utilization in their teaching to reduce the use of lecture method.

2. The use of Powerpoint presentation in teaching metalwork technology in schools should be encouraged by bothFederaland States Ministries of Education, through organizing seminars, workshops and conferences for teachers of Science and Technology on

utilization of PowerPoint presentation in teaching Science and Technical subjects in Secondary Schools.

3. There is the need for Federal and State Ministries of Education, Teacher Training Institutions and non-governmental professional organizations such as STAN, NATT, NSE, etcto organize a training workshops and seminars for teachers on the importance of utilizing projected instructional resources in order to enhance the quality of teaching in secondary schools in Nigeria

5.5 Contributions of the Study to Knowledge

The study has contributed to knowledge in the following ways:

i. The researcher was able to establish that the use of Powerpoint presentation in teaching enhances the performance of metalwork technology students than conventional method, therefore encouraged its usage in teaching metalwork technology.

ii. The researcher examined the efficacy of the use of Powerpoint presentation in learning a particular concept by rural and urban students. The findings contributed to the body of knowledge in proving that the use of PowerPoint presentation in teaching enhances the performance of students irrespective of location.

iii. The researcher was able to establish that the use of PowerPoint presentation in teaching enhances performance of metalwork technology students irrespective of gender than conventional method, therefore encouraged its usage in general teaching methods in all subjects.

5.6 Limitations of the Study

The following limitations were observed in the conduct of this study:

I. The samples used for the study were limited to Kaduna State public schools only. Others such as Private and Federal Government Schools were not involved in the study. If such schools were involved, the result of findings may be different from the one obtained. This is therefore a limitation on the scope of generalization of the findings.

II. The time taken in conducting this study was just six weeks. If adequate time was given, the result of finding may be different from the present study results.

5.7 Suggestions for Further Study

The researcher suggest for the need of conducting similar research on;

1. Effect of PowerPoint presentation on Academic Performance among Metalwork technology students in Senior Secondary School of North-Western Nigeria.

2. Relative Efficacy of Instructional PowerPoint Projector on Secondary School Students interest, and motivation towards Metalwork technology in Nigerian Colleges of Education.

3. The use of community resources in the teaching of metal work in Secondary School in Zaria Senatorial Zone.

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Appendix A

Table I. Ten years Percentage of Metalwork technology students passed

Year of examination taken	Percentage passed
2007	30.7%
2008	32.9%
2009	34.6%
2010	31.9%
2011	37.9%
2012	42.8%
2013	40.3%
2014	45.4%
2015	47.1%
2016	39.7%

Source: Education Resource Center, Kaduna (2017).

Appendix B

Table II: Population of the Study (2115).

S/N	NAMES OF SCHOOLS	NO OF MALE	NO OF FEMALE	TOTAL
1	Barewa College Zaria	110	-	110
2	Alhuda-huda College Zaria	125	-	125
3	G.S.S Yakasai	43	17	60
4	G.S.S Tudun-Saibu	46	18	64
5	GSS Aminu	52	25	77
6	G.S.S Dinya	41	26	67
7	GSS Dakace	56	31	87
8	GSS Tudun-jukun	76	29	105
9	GGSS Pada	-	86	86
10	GGSS DogonBauchi	-	111	111
11	SIASS Karau-karau	46	31	77
12	G.GSS Chindit	-	98	98
13	GGSS KofanGayan	-	86	86
14	GSS Chindit	78	-	78
15	GSS Magajiya	69	-	69
16	GSS (WTC)	-	96	96
17	GSS Zaria (Tukur-Tukur)	89	-	89
18	GSS Kaura	69	31	100
19	GSS KofanKuyambana	52	24	76
20	GSS Awai	48	-	48
21	GSS Likoro	93	-	93
22	GSS Muchia	68	36	104
23	SSS Kufena	111	-	111
24	Commercial College	67	31	98
	TOTAL			**2115**

Source: Ministry of Education, Kaduna State, Zonal Inspectorate Division Zaria (2013).

Appendix C

SUBJECT: METAL WORK TECHNOLOGY **TIME: 30 MINS**

LEVEL: SS II

INSTRUCTIONS: ANSWER ALL QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS

Instructions

Please read the following instruction carefully before you answer the questions

1. Write your school name, class and identification number provided for the examination in the space provided in the answer sheet.
2. Read each question carefully before answering it. If you find a question difficult, go on to the other questions and finish them first.
3. After you have selected what you have taken to be correct answer, go to your answer sheet and shade appropriate alphabet in the space that corresponds with your choice.
4. Shade only one letter for each answer in the objective questions.
5. If you change your mind on any answer, completely erase the first shading.

Now attempt the following Questions.

1. Which of these furnaces produce pig iron?

a) Copular furnace b) Open hearth furnace c) Blast furnace

2. What is the function of a coke in the blast furnace?

a) Fuel b) Flux c) Limestone

3. What is used in the blast furnace as fuel?

a) Petrol b) Coke c) Silicon

4. Which of the following is loaded with iron ore to produce pig iron

a) Sulphur b) Limestone c) Coke and Limestone

5 The device used in converting iron ore to pig iron is

a) Blast furnace b) Copular furnace c) Electric furnace

6 The type of furnace use to produce steel is

a) Blast Furnaceb) ElectricFurnzcec) Paddling Furnace

7. Which of these is a Non-ferrous metal?

a) Wrought iron b) Copper c) Mild steel

8. What is the colour of Brass?

a) Red b) Blue c) Yellow

9. What are the main differences between ferrous and non-ferrous metal

a) Carbonb) Sulphurc) Silicon

10. Identify a ferrous metal from the following

a) Brassb) Cast iron c) Lead

TOPIC: 2 TOOLS **TIME: 30MINS**

LVEL: SS II

1. How many types of tools do we have?

   a) 3 b) 2 c) 1

2. A machine tool is operated by

   a) Electricity b) Hand c) Leg

3. A steel rule operated by

   a) Electricity b) Hand c) Sensor

4. …… is used for taking external diameter of a ball

   a) Steel rule b) Scriber c) Vanier Caliper

5. …… is used for cutting metals

   a) Hack Saw b) Hammer c) Plier

6. Drilling machine is used for …… on metals

   a) Creating Hole b) Scratched c) Polishing

7. ……. Is used for sharpening machine tools

   a) Hammer b) Reamer c) Grinding Machine

8. Head stock and tail stock are part of …… machine

   a) Milling Machine b) Lathe Machine c) Grinding Machine.

9. Shaping machine is used to produce …….

   a) Flat surface b) Round surface c) Holes

10. …… is used for the production of Key ways and slots.

    a) Indexing machi b) Milling Machine c) power saw

Appendix D

MARKING SCHEMEFOR THE OBJECTIVES QUESTIONS

TEST 1		TEST 2	
1.	C	1.	B
2.	A	2.	A
3.	B	3.	B
4.	D	4.	C
5.	A	5.	A
6.	C	6.	A
7.	B	7.	C
8.	B	8.	B
9.	C	9.	A
10.	A	10.	C

Appendix E

ANSWER SHEET FOR METAL ACADEMIC PERFORMANCE TEST (MAPT)

BIODATA

Name:……
School:……...
Class:……Identification No.:……..

Gender: **Male: ( )** **Female: ( )**

1	=A=	=B=	=C=	1.	=A= =B= =C=
2	=A=	=B=	=C=	2.	=A= =B= =C=
3	=A=	=B=	=C=	3.	=A= =B= =C=
4	=A=	=B=	=C=	4.	=A= =B= =C=
5	=A=	=B=	=C=	5.	=A= =B= =C=
6	=A=	=B=	=C=	6.	=A= =B= =C=
7	=A=	=B=	=C=	7.	=A= =B= =C=
8	=A=	=B=	=C=	8.	=A= =B= =C=
9	=A=	=B=	=C=	9.	=A= =B= =C=
10	=A=	=B=	=C=	10.	=A= =B= =C=
11	=A=	=B=	=C=	11.	=A= =B= =C=
12	=A=	=B=	=C=	12.	=A= =B= =C=
13	=A=	=B=	=C=	13.	=A= =B= =C=
14	=A=	=B=	=C=	14.	=A= =B= =C=
15	=A=	=B=	=C=	15.	=A= =B= =C=
16	=A=	=B=	=C=	16.	=A= =B= =C=
17	=A=	=B=	=C=	17.	=A= =B= =C=
18	=A=	=B=	=C=	18.	=A= =B= =C=
19	=A=	=B=	=C=	19.	=A= =B= =C=
20	=A=	=B=	=C=	20.	=A= =B= =C=

Appendix F

LESSON PLAN FOR EXPERIMENTAL GROUP

Week **One**

Date **07-08-16**

Time **8:30-9:00am**

Duration: 30 Minutes

Class: SS II

Group Experimental

Gender Males/Females

Average Age 14-16 years

Subject: Metal work technology

Topic: Production of Pig Iron

Sub-topic Meta work technology, Iron Ore

Behavioral Objective By the end of the lesson, students should be able to:

(i) Define what an iron is.

(ii) Enumerate the three types of iron ore

(iii) Briefly explain the first three steps to be followed in the process for the production of pig iron

Instructional Media Computer and Overhead Projector

Previous Knowledge Student were taught Metals

Introduction The teacher introduces the lesson by asking the students some questions based on what they have previously been taught.

(i) What is a metal?

(ii) How many classes of metal do we have?

(iii) Differentiate between ferrous and non-ferrous metal?

PresentationThe teacher presented the lesson base on the following steps.

Steps I: The teacher defines Iron and shown the definition on the screen.

- An Iron is defined as an Element which is the basic substance of the earth's covering.

  It is found with other elements in the form of iron ore.

Step II: The teacher made mentioned of the three different types of iron ore:

There are three (3) main types of iron ore. These are:

i) Hematite

ii) Magnetic

iii) Limonite.

Step III The teacher goes to the 3rd slide to show the first three steps in the process for the production of pig iron.

1.The iron ore is dug (mined) from the ground.

2 The iron ore is mixed with coke and limestone

3 The three ingredients are fed into the blast furnace

The three ingredients are:

i. Iron ore

ii. Limestone

iii. Coke

Students' activities: The teacher asked the students some questions on the topic presented to them based on what they saw on the screen. Example.

- Define Iron Ore.
- Mention the three main types of ore
- Name at least two steps to be followed in the process for the production of pig iron.

Evaluation: The teacher evaluates the lesson by following over the lesson and allow the students to ask questions based on the lesson treated

(i) Define iron ore?

(ii) Mention three types of iron ore.

(iii) Name the three steps to be followed in the process for the production of pig iron.

Conclusion: The teacher concludes the lesson by giving assignment to the students and allow them to copy the points on the screen in their exercise books.

Assignment:

- In your own understanding or words define iron ore
- List the three types of iron ore you know
- What are the first two steps to be followed in the process for the production of pig iron.

LESSON PLAN FOR EXPERIMENTAL GROUP

Week	**Two**
Date	**15-08-16**
Time	**8:30-9:00am**
Duration:	30 Minutes
Class:	SS II
Group	Experimental group
Gender	Males/Females
Average Age	14-16 years
Subject:	Metalwork technology.
Topic:	Production of pig iron (continued).
Sub-topic	Blast furnace and its contents.
Behavioral Objective	By the end of the lesson, students should be able to:
	(i) Draw the section of a blast furnace
	(ii) Label its parts
	(iii) Show the contents in the furnace.
Instructional Material	Slides of PowerPointonprojector

Previous Knowledge Student were taught the definition of iron ore and its' types on the screen of projector.

Introduction The teacher introduces the lesson by asking the students some questions based on the previous lesson

(i) What is an iron ore?

(ii) Mention the three main types of iron ore.

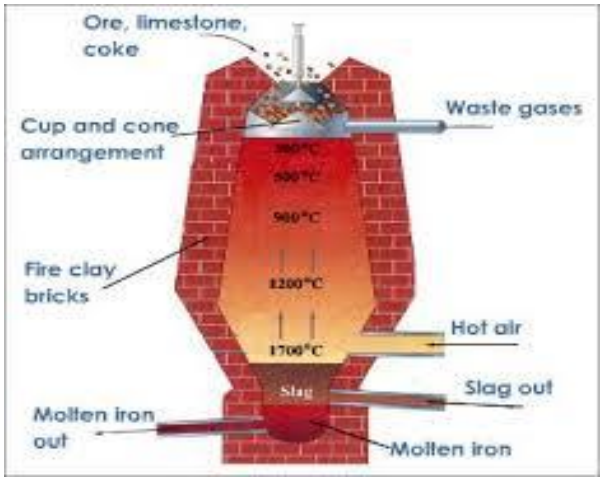
(iii) Name at least three steps to be followed in the process for the production of pig iron.

Presentation: The teacher presents the lesson based on the following steps

The teacher open the computer and project the slide for the continuation of the previous lesson.

Step I The teacher will show the cross section of a blast furnace on the screen as follows

A blast furnace is a vertical steel cylinder, lined with firebricks as can be seen on the drawing.



Step II

The teacher will explain the parts of the blast furnace as follows

- Metallic cylinder
- Fire bricks
- The gates (two inlet, two out lets, the cup and con arrangements)
- Tuyyeres.

Step III

The teacher will explain the processes under taken in the furnace.

- The furnace is lit and the intensity of the fire is increased by a blast of air which is heated by travelling round outside of the furnace in large pipes and their forced in at the bottom through tuyyeres.
- The oxygen in the air makes the coke to burn fiercely.
- The iron will melt and trickles down wards and form a pool at the bottom of the furnace.

Students' activities. The teacher asked the students some questions on the topic presented to them based on what they saw on the screen. Example.

- From what materials does a blast furnace made of?
- Name at least three parts of a blast furnace
- What is the function of a coke in the furnace?

Evaluation: The teacher evaluates the lesson by following over the lesson and allow the students to ask questions based on the lesson treated

Example:

(i) What is blast furnace made of?

(ii) State the features of a blast furnace

(iii) Briefly explain at least two processes taken place in the furnace

Conclusion: The teacher concludes the lesson by giving the summary the entire lesson and give assignment for the students.

Assignment:

i) Draw and label the parts of a blast furnace

ii) Briefly explain at least three processes taken place in the furnace

LESSON PLAN FOR EXPERIMENTAL GROUP

Week	**Three**
Date	**25-08-16**
Time	**8:30-9:00am**
Duration:	30 Minutes
Class:	SS II
Group	Experimental
Gender	Males/Females
Average Age	14-16 years
Subject:	Metal work technology
Topic:	Production of Pig iron (continued)
Sub-topic	Processes under taken in the blast furnace
Behavioral Objective	By the end of the lesson, students should be able to:

(i) Review briefly the first three Processes under taken in the blast furnace for the production of pig iron

(ii) Explain the remaining processes under taken in the blast furnace for the production of pig iron.

Instructional Media Slides of PowerPoint Projector.

Previous Knowledge Student have been taught some processes under taken in the blast furnace.

Introduction The teacher introduces the lesson by asking students some questions based on their previous knowledge of the lesson.

Name some parts of a blast furnace turyyers, in lets, outlets, firebricks cup, con etc.

Presentation: The teacher will continue explaining the processes under taken in the furnace.

Step 1: Students briefly explain the processes under taken in the blast furnace.

- The furnace is lit and the intensity of the fire is increased by a blast of air which is heated by travelling round outside of the furnace in large pipes and their forced in at the bottom through tuyyeres.
- The oxygen in the air makes the coke to burn fiercely.
- The iron will melt and trickles down wards and form a pool at the bottom of the furnace.

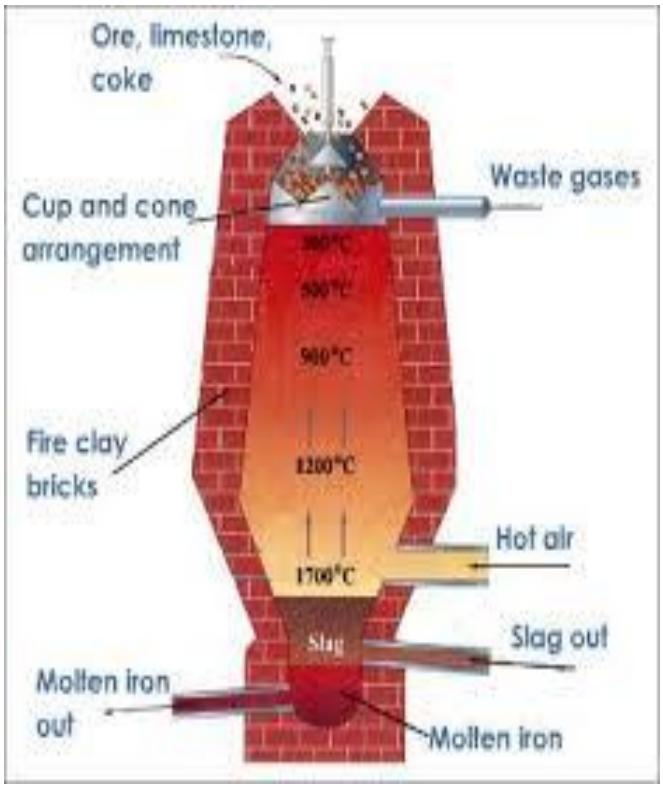
Step II: The teacher now continue from where the students stopped

- The waste products (slag) also trickle down, and float on the top of the pool of the molten iron.
- At intervals the iron and the slag are tapped off. The tapped iron is called pig iron.
- The iron is dealt within one of the three ways.

1. Fed into a pig casting machine which moulds into small bars.

2. Conveyed to steel works in its molten state.

3. Refined for casting.



Evaluation: The teacher evaluates the lesson by asking some questions base on the lesson treated

Example:

(i) What do we call the impurities in the blast furnace?

(ii) What do we call the tapped iron from the furnace?

(iii) How does the pig iron dealt with?

Conclusion: The teacher concludes the lesson by revising briefly what he taught and give assignment to students.

Assignment: With the aid of a free hand sketch explain the production of pig iron.

LESSON PLAN FOR CONTROL GROUP

Week	**One**
Date	**07-08-16**
Time	**10:30-11:00am**
Duration:	30 Minutes
Class:	SS II
Group	Experimental
Gender	Males/Females
Average Age	14-16 years
Subject:	Metal work technology
Topic:	Production of Pig Iron
Sub-topic	Meta work technology, Iron Ore
Behavioral Objective	By the end of the lesson, students should be able to:

(i) Define what an iron is.

(ii) Enumerate the three types of iron ore

(iii) Briefly explain the first three steps to be followed in the process for the production of pig iron

Instructional Media Computer and Overhead Projector

Previous Knowledge Student were taught Metals

Introduction The teacher introduces the lesson by asking the students some questions based on what they have previously been taught.

(i) What is a metal?

(ii) How many classes of metal do we have?

(iii) Differentiate between ferrous and non-ferrous metal?

Presentation: The teacher presented the lesson base on the following steps.

Steps I: The teacher defines Iron and shown the definition on the screen.

- An Iron is defined as an Element which is the basic substance of the earth's covering.

  It is found with other elements in the form of iron ore.

Step II: The teacher made mentioned of the three different types of iron ore:

There are three (3) main types of iron ore. These are:

iv) Hematite

v) Magnetite

vi) Limonite.

Step III The teacher goes to the 3rd slide to show the first three steps in the process for the production of pig iron.

- ▶ The iron ore is dug (mined) from the ground.
- ▶ The iron ore is mixed with coke and limestone
- ▶ The three ingredients are fed into the blast furnace

The three ingredients are

iv. Iron ore

v. Limestone

vi. Coke

Students' activities: The teacher asked the students some questions on the topic presented to them based on what they saw on the screen. Example.

- Define Iron Ore.
- Mention the three main types of ore
- Name at least two steps to be followed in the process for the production of pig iron.

Evaluation: The teacher evaluates the lesson by following over the lesson and allow the students to ask questions based on the lesson treated

(iv) Define iron ore?

(v) Mention three types of iron ore.

(vi) Name the three steps to be followed in the process for the production of pig iron.

Conclusion: The teacher concludes the lesson by giving assignment to the students and allow them to copy the points on the screen in their exercise books.

Assignment:

- In your own understanding or words define iron ore
- List the three types of iron ore you know
- What are the first two steps to be followed in the process for the production of pig iron.

Appendix G

LESSON PLAN FOR CONTROL GROUP

Week	**One**
Date	**07-08-16**
Time	**8:30-9:00am**
Duration:	30 Minutes
Class:	SS II
Group	Control Group
Gender	Males/Females
Average Age	14-16 years
Subject:	Metal work technology
Topic:	Production of Pig Iron
Sub-topic	Meta work technology, Iron Ore
Behavioral Objective	By the end of the lesson, students should be able to:

i) Define what an iron is.

ii) Enumerate the three types of iron ore

(iii) Briefly explain the first three steps to be followed in the process for the production of pig iron.

Previous Knowledge Student were taught Metals

Introduction The teacher introduces the lesson by asking the students some questions based on what they have previously been taught.

(i) What is a metal?

(ii) How many classes of metal do we have?

(iii) Differentiate between ferrous and non-ferrous metal?

Presentation: The teacher presented the lesson base on the following steps.

Steps I: The teacher defines Iron and write the definition on the chalk board.

- An Iron is defined as an Element which is the basic substance of the earth's covering.

  It is found with other elements in the form of iron ore.

Step II: The teacher made mentioned of the three different types of iron ore:

There are three (3) main types of iron ore. These are:

vii) Hematite

viii) Magnetite

ix) Limonite.

Step III The teacher goes to the 3rd slide to show the first three steps in the process for the production of pig iron.

- The iron ore is dug (mined) from the ground.
- The iron ore is mixed with coke and limestone
- The three ingredients are fed into the blast furnace

The three ingredients are

i) Iron ore

ii) Limestone

iii) Coke

Students' activities: The teacher asked the students some questions on the topic presented to them based on what they saw on the screen, example.

- Define Iron Ore.
- Mention the three main types of ore
- Name at least two steps to be followed in the process for the production of pig iron.

Evaluation: The teacher evaluates the lesson by following over the lesson and allow the students to ask questions based on the lesson treated

i) Define iron ore?

ii) Mention three types of iron ore.

iii) Name the three steps to be followed in the process for the production of pig iron.

Conclusion: The teacher concludes the lesson by giving assignment to the students and allow them to copy the points on the screen in their exercise books.

Assignment:

- In your own understanding or words define iron ore
- List the three types of iron ore you know
- What are the first two steps to be followed in the process for the production of pig iron.

LESSON PLAN FOR CONTROL GROUP

Week	**Two**
Date	**15-08-16**
Time	**8:30-9:00am**
Duration:	30 Minutes
Class:	SS II
Group	Control group
Gender	Males/Females
Average Age	14-16 years
Subject:	Metalwork technology.
Topic:	Production of pig iron (continued).
Sub-topic	Blast furnace and its contents.
Behavioral Objective	By the end of the lesson, students should be able to:
	(i) Draw the section of a blast furnace
	(ii) Label its parts
	(iii) Show the contents in the furnace.

Previous Knowledge Student were taught the definition of iron ore and its' types on the screen of projector.

Introduction The teacher introduces the lesson by asking the students some questions based on the previous lesson

(i) What is an iron ore?

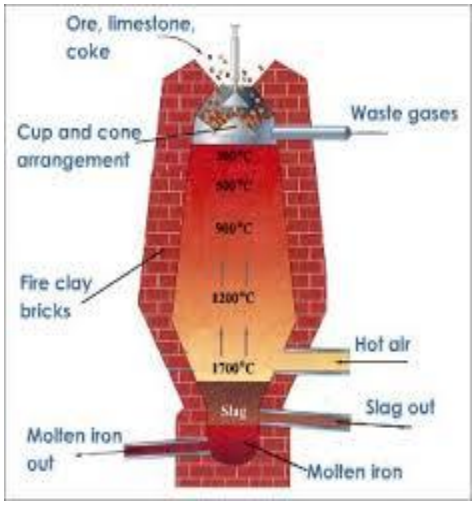
(ii) Mention the three main types of iron ore.

(iii) Name at least three steps to be followed in the process for the production of pig iron.

Presentation: The teacher presents the lesson based on the following steps

The teacher open the computer and project the slide for the continuation of the previous lesson.

Step I The teacher will draw the cross section of a blast furnace on the chalk board and label its parts.



A blast furnace is a vertical steel cylinder, lined with firebricks as can be seen on the drawing.

The teacher will explain the parts of the blast furnace as follows

- Metallic cylinder
- Fire bricks
- The gates (two inlet, two out lets, the cup and con arrangements)
- Tuyyeres.

Step III

The teacher will explain the processes under taken in the furnace.

- The fusrnace is lit and the intensity of the fire is increased by a blast of air which is heated by travelling round outside of the furnace in large pipes and their forced in at the bottom through tuyyeres.
- The oxygen in the air makes the coke to burn fiercely.
- The iron will melt and trickles down wards and form a pool at the bottom of the furnace.

The teacher asked the students some questions on the topic presented to them based on what they saw on the screen. Example.

- From what materials does a blast furnace made of?
- Name at least three parts of a blast furnace

- What is the function of a coke in the furnace?

The teacher evaluates the lesson by following over the lesson and allow the students to ask questions based on the lesson treated

Example:

i) What is blast furnace made of?

ii) State the features of a blast furnace

iii) Briefly explain at least two processes taken place in the furnace

: The teacher concludes the lesson by giving the summary the entire lesson and give assignment for the students.

Assignment:

i) Draw and label the parts of a blast furnace

ii) Briefly explain at least three processes taken place in the furnace

LESSON PLAN FOR CONTROL GROUP

Three25-08-168:30-9:00am: 30 Minutes

: SS II

ControlMales/Females

14-16 years : Metal work technology

: Production of Pig iron (continued)

Processes under taken in the blast furnace

By the end of the lesson, students should be able to:

(i) Review briefly the first three Processes under taken in the blast furnace for the production of pig iron

(ii) Explain the remaining processes under taken in the blast furnace for the production of pig iron.

Student have been taught some processes under taken in the blast furnace.

The teacher introduces the lesson by asking students some questions based on their previous knowledge of the lesson. Name some parts of a blast furnacetuyyers, in lets, outlets, firebricks cup, con etc.

: The teacher will continue explaining the processes under taken in the furnace.

Students briefly explain the processes under taken in the blast furnace.

- The furnace is lit and the intensity of the fire is increased by a blast of air which is heated by travelling round outside of the furnace in large pipes and their forced in at the bottom through tuyyeres.
- The oxygen in the air makes the coke to burn fiercely.
- The iron will melt and trickles down wards and form a pool at the bottom of the furnace.

The teacher now continue from where the students stopped

- The waste products (slag) also trickle down, and float on the top of the pool of the molten iron.
- At intervals the iron and the slag are tapped off. The tapped iron is called pig iron.
- The iron is dealt within one of the three ways.

4. Fed into a pig casting machine which moulds into small bars.
5. Conveyed to steel works in its molten state.
6. Refined for casting.

: The teacher evaluates the lesson by asking some questions base on the lesson treated

Example:

(iv) What do we call the impurities in the blast furnace?

(v) What do we call the tapped iron from the furnace?

(vi) How does the pig iron dealt with?

: The teacher concludes the lesson by revising briefly what he taught and give assignment to students.

: With the aid of a free hand sketch explain the production of pig iron.

LESSON PLAN FOR CONTROL GROUP

Three25-08-168:30-9:00am: 30 Minutes

: SS II

ControlMales/Females

14-16 years : Metal work technology

: Production of Pig iron (continued)

Processes under taken in the blast furnace

By the end of the lesson, students should be able to:

(i) Review briefly the first three Processes under taken in the blast furnace for the production of pig iron

(ii) Explain the remaining processes under taken in the blast furnace for the production of pig iron.

Student have been taught some processes under taken in the blast furnace.

The teacher introduces the lesson by asking students some questions based on their previous knowledge of the lesson. Name some parts of a blast furnacetuyyers, in lets, outlets, firebricks cup, con etc.

: The teacher will continue explaining the processes under taken in the furnace.

Students briefly explain the processes under taken in the blast furnace.

- The furnace is lit and the intensity of the fire is increased by a blast of air which is heated by travelling round outside of the furnace in large pipes and their forced in at the bottom through tuyyeres.
- The oxygen in the air makes the coke to burn fiercely.
- The iron will melt and trickles down wards and form a pool at the bottom of the furnace.

The teacher now continue from where the students stopped

- The waste products (slag) also trickle down, and float on the top of the pool of the molten iron.
- At intervals the iron and the slag are tapped off. The tapped iron is called pig iron.
- The iron is dealt within one of the three ways.

7. Fed into a pig casting machine which moulds into small bars.
8. Conveyed to steel works in its molten state.
9. Refined for casting.

: The teacher evaluates the lesson by asking some questions base on the lesson treated

Example:

(vii) What do we call the impurities in the blast furnace?

(viii) What do we call the tapped iron from the furnace?

(ix) How does the pig iron dealt with?

: The teacher concludes the lesson by revising briefly what he taught and give assignment to students.

: With the aid of a free hand sketch explain the production of pig iron.

LESSON PLAN FOR CONTROL GROUP

Three25-08-168:30-9:00am: 30 Minutes

: SS II

ControlMales/Females

14-16 years : Metal work technology

: Production of Pig iron (continued)

Processes under taken in the blast furnace

By the end of the lesson, students should be able to:

(i) Review briefly the first three Processes under taken in the blast furnace for the production of pig iron

(ii) Explain the remaining processes under taken in the blast furnace for the production of pig iron.

Student have been taught some processes under taken in the blast furnace.

The teacher introduces the lesson by asking students some questions based on their previous knowledge of the lesson. Name some parts of a blast furnace e.gtuyyers, in lets, outlets, firebricks cup, con etc.

: The teacher will continue explaining the processes under taken in the furnace.

Students briefly explain the processes under taken in the blast furnace.

- The furnace is lit and the intensity of the fire is increased by a blast of air which is heated by travelling round outside of the furnace in large pipes and their forced in at the bottom through tuyyeres.
- The oxygen in the air makes the coke to burn fiercely.
- The iron will melt and trickles down wards and form a pool at the bottom of the furnace.

The teacher now continue from where the students stopped

- The waste products (slag) also trickle down, and float on the top of the pool of the molten iron.
- At intervals the iron and the slag are tapped off. The tapped iron is called pig iron.
- The iron is dealt within one of the three ways.

10. Fed into a pig casting machine which moulds into small bars.
11. Conveyed to steel works in its molten state.
12. Refined for casting.

: The teacher evaluates the lesson by asking some questions base on the lesson treated

Example:

(x) What do we call the impurities in the blast furnace?

(xi) What do we call the tapped iron from the furnace?

(xii) How does the pig iron dealt with?

: The teacher concludes the lesson by revising briefly what he taught and give assignment to students.

: With the aid of a free hand sketch explain the production of pig iron.

LESSON PLAN FOR CONTROL GROUP

Three25-08-168:30-9:00am: 30 Minutes

: SS II

ControlMales/Females

14-16 years : Metal work ttechnology

: Classification of metals.

Ferrous and Non-Ferrous metals.

By the end of the lesson, students should be able to:

(i) Mention the two classes of metal

(ii) Differentiate between the two classes of metal

(iii) Give examples of Ferrous and Non-Ferrous metals

Student have been taught Production of pig iron.

The teacher introduces the lesson by asking students some questions based on their previous knowledge of the lesson. Name some parts of a blast furnace tuyyers, in lets, outlets, firebricks cup, con etc.

: The teacher will write the new topic on the chalk board.

CASSIFICATION OF METALS

The teacher will ask the students as follows.

How many classes of metals do we have?

There are two classes of metal. These are:

i) Ferrous Metals and

ii) Non-Ferrous Metals.

Students should differentiate the two classes of metals. Thus,

Ferrous metal is defined as a metal that contain high percentage of carbon.

Non-ferrous metals are metals that contain little percentage or no carbon.

Therefore the difference between ferrous and non-ferrous metals is shown below.

	Ferrous Metals	Non-Ferrous Metals
1 2 3	Ferrous metals contain high % of carbon They are dark in colour They are heavy in weight	Contains little % or NO carbon They are bright in colour. They are light in weight

Students should give examples of ferrous and Non-ferrous metals.

Examples of ferrous metals are: Wrought iron, Cast iron, Mild steel, High carbon steel, Low carbon steel, High speed steel etc.

Examples of Non-ferrous metals are: Copper, Zinc, Aluminium, Lead, Tin, Silver and Gold.

: The teacher evaluates the lesson by asking some questions base on the lesson treated

Example:

i) How many classes of metals do we have?

ii) Mention the classes of metals.

iii) Differentiate between the two classes of metals and give three examples of each.

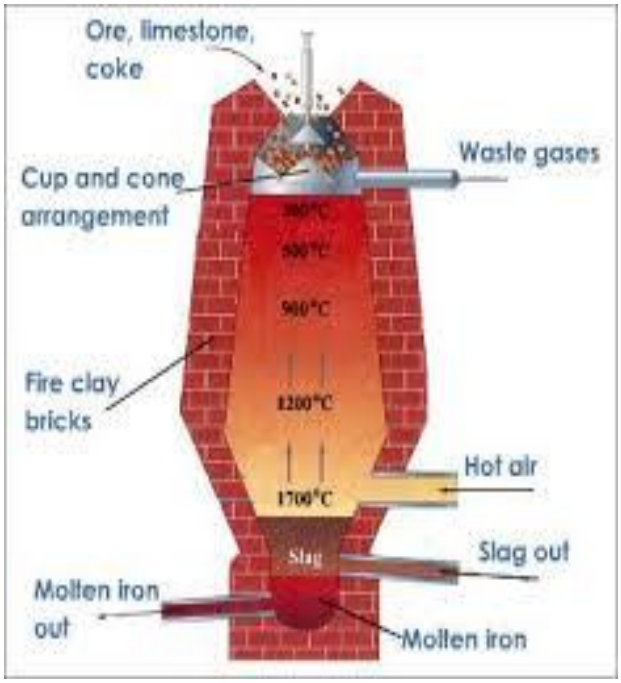
: The teacher concludes the lesson by revising briefly what he taught and give assignment to students.

:

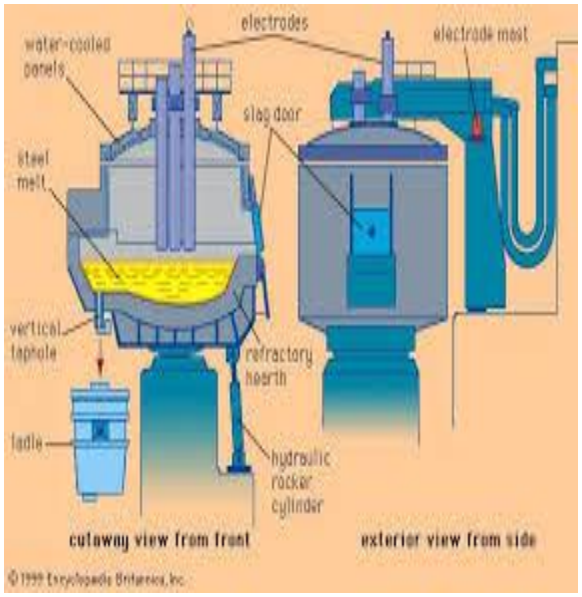
- Write down the two classes of metals
- Define ferrous and non-ferrous metals
- Differentiate between ferrous and non-ferrous metals and
- Give three examples of each.

AppendixH

Furnaces



A Blast Furnace

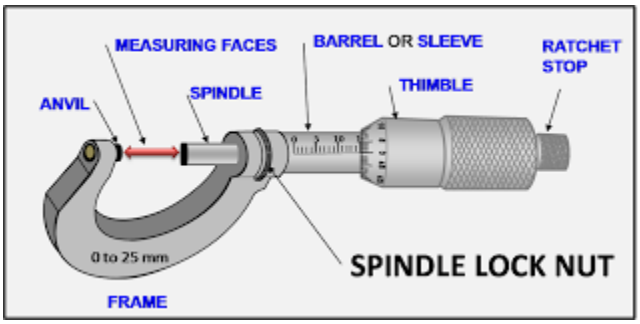


An Electric Hearth Furnace

Appendix I

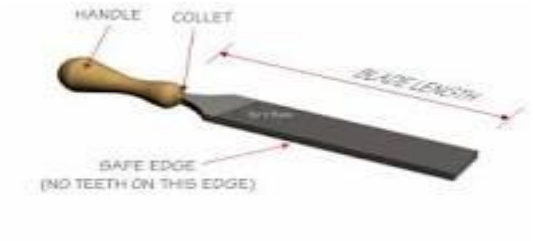
Hand Tools

Outside caliper



A Micrometer Screw Gauge

A Steel Rule



Flat File

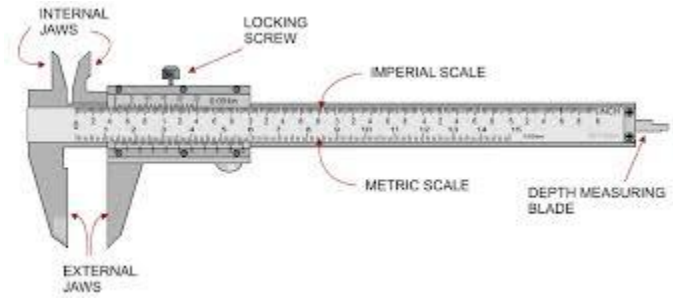
A Hack Saw

Plier

A Try Square

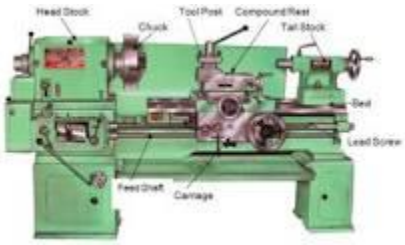
A Mallet

A Hammer



Vernier Caliper

Machine Tools



Lathe Machine

Drilling Machine

Power Saw

Welding Machine

Appendix J

Projectors

Overhead Projector
DLP

Opaque Projector

LCD Projector

DLP Projector