ZIMBABWE OPEN UNIVERSITY
In collaboration with
THE UNIVERSITY OF ZAMBIA

THE EFFECTS OF POWERPOINT AS OPPOSED TO LECTURE PRESENTATIONS ON CONTENT UNDERSTANDABILITY IN SCIENCE EDUCATION.

A CASE OF CHIPATA COLLEGE OF EDUCATION: STUDENTS.

A Dissertation Report

By

Thole Jonathan

Submitted to the Zimbabwe Open University / The University of Zambia in Partial Fulfilment of the Requirements for the Degree of **Master** of Education

In

Education Management and Administration.

Lusaka, Zambia

2017.

ZIMBABWE OPEN UNIVERSITY

In collaboration with

THE UNIVERSITY OF ZAMBIA

APPROVAL FORM.

The undersigned certify that they have read, and recommend to Zimbabwe Open University/The University of Zambia for acceptance of a dissertation entitled "THE EFFECTS OF POWERPOINT AS OPPOSED TO LECTURE PRESENTATIONS ON CONTENT UNDERSTANDABILITY IN SCIENCE EDUCATION. A CASE OF CHIPATA COLLEGE OF EDUCATION: STUDENTS**".**

Submitted by **Thole Jonathan** in Partial Fulfilment of the Requirements for the Degree of **Master of Education in Education Management and Administration.**

……..

……..

SUPERVISOR

……..

……..

PROGRAMME COORDINATOR

……..

……..

EXTERNAL EXAMINER

DATE: ……/……/……

ZIMBABWE OPEN UNIVERSITY

In collaboration with

THE UNIVERSITY OF ZAMBIA

RELEASE FORM.

NAME OF AUTHOR: THOLE JONATHAN.

TITLE OF PROJECT: The Effects of PowerPoint as opposed to lecture presentations on content understandability in Science Education. A case of Chipata College of Education: Students**".**

DEGREE FOR WHICH PROJECT WAS PRESENTED: Master of Education in Education Management and Administration.

YEAR DEGREE WAS GRANTED: 2017.

Permission is hereby granted to the Zimbabwe Open University/ The University of Zambia Library to reproduce single Copies of this Dissertation and lend or sell such copies for private, scholarly or scientific research purpose only.

The author reserves other publication rights and neither the dissertation nor extensive extracts from it may be printed or otherwise reproduced without the author's written permission.

SIGNED: ……

PERMANENT ADDRESS: Changaya Farms, Lundazi-Zambia.

DEDICATION

This dissertation is dedicated to my mother, Margaret kaponda, my wife, Charity Kazovu, my three sons - David Thole, Tabernacle Thole and Elija Thole in remembrance of their support during the period of my study.

ABSTRACT

The purpose of the study was to assess and ascertain the effectiveness of simple text PowerPoint Presentations as compared to the traditional 'chalk and talk' methods preferred by tutors and lecturers of science education in primary teaching colleges through students' scores of an achievement test after a treatment. This paper discusses the importance of an effective instruction delivery mode as evidenced by the decline in performance of newly deployed teachers in Zambian primary schools. Benefits of simple PowerPoint presentation in classroom instruction as a means to improve classroom teaching in Zambian Primary Colleges are also discussed. The effectiveness of Simple PowerPoint Presentation (PPP) and the traditional 'chalk and talk' methods for teaching Science Education concepts were determined using a pre - test-post - test, non-equivalent, non-randomized experimental group design. One hundred twenty 1st year students (59 male and 61 female) from Chipata College of Education formed the sample. The two classes were randomly assigned to experimental and control groups. The experimental group was taught some selected concepts from Science Education using Simple PowerPoint Presentation (SPPP) while 'Chalk and talk' method was maintained for the control group. A validated Science Education Achievement Test (SEAT) comprising a 25-item multiple-choice test and an opinion Scale Chart containing 15 Themes were employed for data collection.

The study objectives were analysed using SD, z-test and t-test to find the associations between the two teaching modalities and students' comprehension of science concepts. Results revealed that the students taught with Simple PPP performed better than their counterparts taught with 'Chalk and talk' method. The Simple PPP was found also to be gender friendly. Based on the findings, it was recommended that the use of Simple PPP should be encouraged in Zambian Primary Colleges.

TABLE OF CONTENTS

LIST OF TABLES.

LIST OF FIGURES.

ACKNOWLEDGEMENS.

Apart from the major one, King of kings and lord of lords, this study is the result of the support, goodwill and insight of a number of people, all of whom deserve my sincere thanks. The first round of applause should go to my Research supervisor, Doctor. D. Banda for his positive guidance, advice and encouragements.

My thanks also extends to my fellow Education Managers for their support in pursuing this programme.

Finally, I absolutely must acknowledge the forbearance, love, support, resilience and encouragements of my family and friends; my wife in particular.

CHAPTER ONE

1.1. INTRODUTION.

In this Age of Space - driven by ICT, the importance of Education and Media cannot be over-emphasized. This is why most Governments emphasize the need of an effective media (Abd-El-Aziz, 2014). Through effective media, countries like Thailand, Singapore and Malaysia have made huge strides in their economic development. The introduction of a new instruction technology in Education, just like other fields, is greeted by much excitements (Clarks, 1983).

In Zambia, most Instructions are given through verbal or handwritten text and a few using PowerPoint Technology (PPT), mainly as a sign of being modern, contrary to Education goals which aims at producing a citizen responsible to the development of the nation (MoE,1996).

Apart from the tradition "chalk and talk" method of delivery, Computer Assisted Related Instruction Resources (CARIR) have come to play a central role in the Zambian Education system and the Young Generation Teachers (YGT) are more fascinated by this mode of communicating Instructions which the study tried to find out about this fascination. They are various PowerPoint presentations employed by different tutors globally. These range from simple visual texts to complicated graphics and animations.

Microsoft PowerPoint was originally developed by Bob Gasking and software developer Dennis Austin under the name 'presenter of forethought'. Forethought released PowerPoint 1.0 for the Apple Maantosh in April 1987. PowerPoint is part of the Information and Communications Technology (ICT) program. It is an application program of presentation bundled in Microsoft office (El-Ikhan, 2010). It consists of slides allowing the user to present messages. PowerPoint presentation can be used in the class or lecture room for supporting students learning by combining computer and

projector to display slides for illustrating a lesson. Initially, PowerPoint was developed to improve learning by providing means to develop presentations that are more structured and interesting to its audience. It ran in black and white, generating text-and-graphic pages for overhead transparencies. In 1990 the first window version was produced for windows 3.0. PowerPoint is a software tool that has become a presentation staple in lecture halls, conference rooms, and through the application of Computer-Based Training (CBT). It is used in over 30 million presentations a day world-wide, and its software is on 250 million computers world-wide, Alley & Neeley (2005) in Prabhjor, Jasbir, Mandeep, Kanika and Bindu (2015).

The introduction of PowerPoint presentation (PPP) has generated a paradigm shift in the delivery of lectures and has also reminded us that we are living in an ever changing world. The Microsoft PowerPoint has now almost entirely replaced chalkboard or whiteboard teaching at the undergraduate and graduate levels. Most undergraduate and graduate tutors use PowerPoint to deliver lecture content, with a minority of courses taught using the chalkboard or whiteboard, Hill, Arford, Lubitow and Smollin (2012). It is now one of the most widely applied software to students in most colleges and universities. It is also one of the recent teaching modality that has invited a lot of debate and research on students' Performance, Motivation, Comprehension and Attendance. In all learning institutions, there are many factors that contribute to students' understandability and meaningful learning – Delivery-Methods, Tutor-Student Relation and the Learning Environment being some of them.

1.2. STATEMENT OF THE PROBLEM:

Available information show that Zambia still experience wider gaps in her teaching methodologies despite emphasis by Government on the need to provide effective media (MoE, 2013).

In the recent years, there has been a general cry that Education is not responding to the needs of society. This has affected citizens' livelihood in that unemployment and poverty have increased. It is important that tutors use a variety of teaching methods and techniques in order to cater for the range of learning needs taking into account the available local resources, MoE (2013:57). They should as much as possible, use methods that promote active learners' participation and interaction. Methods that will produce self-motivated, lifelong learners who will be confident and productive in school life and in society, MoE: (2013:57). Making students understand a concept is the role of a tutor and should be accompanied by a good delivery mode. Among the many factors that have contributed to poor performance of the students in Colleges and Universities, is poor instruction delivery modes. However, the kind of PowerPoint presentation that was employed in this study, was the simple PowerPoint presentations SPPP which used only simple visual text and formulae.

The current standards in Zambian Education system makes one wonder and doubt the calibre of graduates that are joining the labour force market and how the country will be a Regional Centre of Excellence in Education in line with, (Vision 2030). It is against the afore-mentioned backdrop, that this study tried to address the gap by assessing the effects of Simple PPP as opposed to "C & T" lecture method on students' content understandability through achievement results and students perspectives in Science Education.

1.3. PURPOSE OF THE STUDY:

This study seeks to assess and ascertain the effectiveness of Simple PowerPoint presentation (SPPP) as compared to the traditional "Chalk and Talk" method preferred by tutors and lecturers of Science Education in primary teaching colleges and measure the depth of its suitability on students' content understandability.

1.4. MAIN OBJECTIVE OF THE STUDY:

To compare the effectiveness of Simple PowerPoint presentation and "chalk & talk" methods on students content understandability through achievement results and students perspectives, in Science Education.

1.4.1. SPECIFIC RESEARCH OBJECTIVES

The study wanted to assess:

- Whether there is a statistical difference in the mean scores of students taught Science Education using Simple PowerPoint Presentations (SPPP) and those taught with the Traditional "chalk and talk" method.
- Whether there is a statistical difference in the mean scores of Male and female students taught Science Education using Simple PowerPoint Presentations (SPPP) and those taught with the Traditional "chalk and talk" method.
- Students' preferences between Simple PowerPoint presentation method (SPPP) and the Traditional "chalk and talk" method.

1.5 RESEARCH SUB-QUESTIONS:

- What is the importance of Simple PowerPoint presentation and the Traditional lecture method on students' cognitive achievements?

- Is there any significant difference in achievement results between male and female students using Traditional lecture method with those using the Simple PPP lecture method?
- Why do most student on average prefer being taught using PowerPoint presentation to Traditional lecture method?

1.6. SIGNIFICANCE OF THE STUDY:

With the increasing usability of Computer Assistance Related Instruction Resources (CARIR), it is important to know in depth how these different (CARIR) affects the learning process of students. After the study, the research findings may help the Curriculum Designers, Policy Makers, Politicians, Standards Officers or Monitors, School and College Proprietors, NGOs and other stake-holders to use the findings to recommend and provide solutions to existing challenges surrounding the teaching of students in class. It may also contribute to the intervention toward the reduction of the challenges of ineffective teaching methods faced by most Lecturers and Tutors in Zambia. The curriculum designers, in particular, may use the findings to develop and put in place a comprehensive and diversified curricular that is responsive to the Physical, Social and Economic needs of the individual Learner, Teacher, Tutor and the Community at large.

The findings may also add to policy debate by providing problems surrounding the provision of meaningful Education in the area of Science Education in Zambia and other countries; and thus the study would contribute to the formulation and implementation of ideal policies and practices.

In addition, the findings may add to the existing body of knowledge in the field of Education, Science and Research, and serve as an entry point for researchers intending to pursue the theme further.

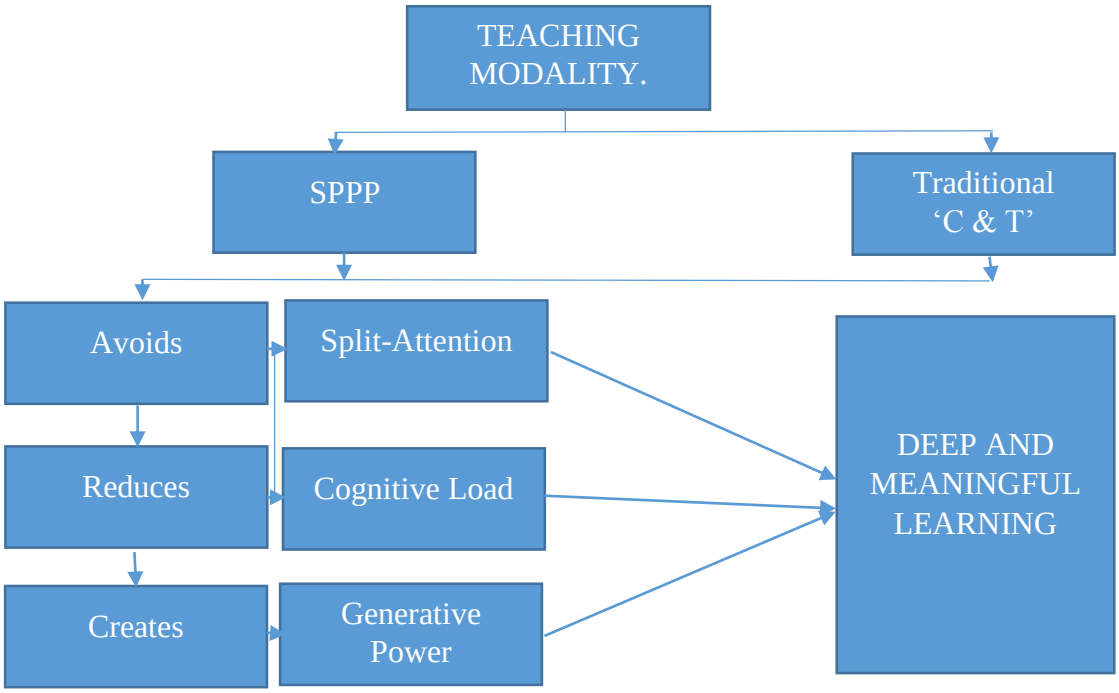
1.7. THEORETICAL FRAMEWORK.

This study made use of both Mayer's (1997, 2001 & 2005) Cognitive Theory of Multimedia Learning (CTML) and Paivio's (1986), Dual-Coding Theory. According to the Dual-Coding Theory of (Paivio, 1986), visual and verbal information are processed in distinct channels and has been widely agreed by educators that teaching or learning materials containing both verbal and visual modes of information improves learning. Mayer (1997), CTML theory assumes that, Information received by the learner is being processes in two different processing systems which have a cognitive load capacity. Auditory narrations goes into the verbal processing system whereas videos /Animations goes into the visual processing system. The theory was constructed based on Cognitive Load theory, (Plass, Moreno, & Brunken, 2010) split attention theory, (Baddeley, 1992), and Generative theory, (Mayer, 1996). In multimedia learning the learner engages in three important cognitive processes. In the first cognitive process, selecting, is applied to incoming verbal information to yield a text base and is applied to incoming visual information to yield an image base. The second cognitive process – organizing - is applied to the word base to create a verbally-based model of the to-be explained system and is applied to the image base to create a visually-based model of the to be-explained system and the third cognitive process involves, integration, and occurs when the learner builds connections between corresponding events (states or parts) in the verbally-based model and the visually-based model. These theories were very significant and relevant to the study in that they set and formed principles that form the foundation on which all cognitive processes are built.

1.8. CONCEPTUAL FRAME WORK.

The flame work below shows some concepts on how meaningful learning can be achieved. The two arrows from the teaching modalities (independent variables) i.e. Simple PowerPoint Presentations (SPPP) and "Chalk & Talk" Methods, show how they influence other learning factors (dependent variables), which are: - Cognitive Load, Students Attention and Generative Power. When these (dependent variables) learning factors are influenced in a positive way, then, deep or meaningful learning will occur. The flame is shown in figure 1.1.

Figure 1.1. Conceptual Frame Work.



1.9. ASSUMPTIONS OF THE STUDY:

The study was conducted under the following assumptions:-

- The respondents gave correct, accurate and factual information that was useful to the Researcher and other interested parties.
- The respondents were co-operative throughout the research process.

- Time and other resources were enough to conduct a thoroughly, deepened and broaden comparative assessment of using Simple PowerPoint Presentations (SPPP) in lectures.

1.10. ORGANISATION OF THE DESSERTATION:

The general organisation of the dissertation was as follows;-

Chapter one. (Background to the study)

Chapter two. (Literature review).

Chapter three. (Research methodology).

Chapter four. (Data presentation, analysis and interpretation).

Chapter five. (Discussions, education implications, conclusions and recommendations).

1.11 BACKGROUND SUMMARY.

This chapter looked at the background context in which the study was conducted. The major items included were problem statement, purpose of the study and the significance of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1. INTRODUCTION.

Several researchers, have examined the effects of PowerPoint presentations. Studies have indicated conflicting findings about PowerPoint effectiveness in improving students' results, Craig & America, Levasseur & Sawyer (2006). Some studies have favoured PPP over C&T Method and; some, vice-versa. However, information on whether Computer Related Presentations (CRP) improve students' motivation to learn is not very clear and much less clear on how it affects students' understandability in Education and this is what this study intended to establish.

Favours on PowerPoint presentations include 'increased convenience,' according to Barsoum, Sellers, Campbell, Heyer & Paradise (2013), 'increased focus on Listening,' according to Bohay, Blakely, Tamplin & Radvansky (2011) and 'more accurate and readable notes' according to Breckler, Joun & Ngo (2009). Other studies point to the idea that visual presentations and graphics improve students' recall Chan Lin (2000) and Szaba & Hastings (2000).

On contrary, Savoy (2009), Apperson (2006), Bartsch and Cobern (2003), Beets and Lobingier (2001), Susskind (2005) and Szabo and Hastings (2000) reported that they did not find any beneficial effects of PowerPoint on students' academic achievement.

In Zambia, it seems there is no documented literature on the effects of PowerPoint presentations on students' achievements and motivation and that is the vacuum this study was filling.

2.2.1. PROPONENTS OF POWERPOINT PRESENTATIONS (PPP).

Cognitive achievement connotes attainment in a school subject as symbolized by a score or mark on an achievement test Okoro (2002). Antherson (2003) contended that

cognitive achievement depends on several factors among which are the instructional methods, learning environment, organisation of learning tasks and the instructor-learner relationship.

The experiment conducted in turkey showed that PPP is more effective in conceptual understanding than 'C & T' (Naki Erdemir). Gier and Kreiner (2009) also reported that PowerPoint increased students' retention. The findings of Nouri and Shahid (2005) indicated a higher understandability of materials of students in PowerPoint Accounting Principles II than their counterparts in a non PPP class. Hyönä (2010); Liu & Chuang (2011) found that visual text seemingly attracts most of learners' attention. What Hyönä, Liu & Chuang are trying to suggest here is that, meaningful learning is achieved when there is no split attention in students. Purnell, Solman, Sadoski, Willson, Paas, Renkl and Sweller, reported that text, imagery and pictures in instruction facilitated conceptual understanding, Purnell & Solman (1991); Sadoski & Willson (2006), Paas, Renkl, & Sweller (2003). While numerous studies tout the merits of the Computer Assisted Instruction (CAI) for rote memorization e.g. Bitzer & Bitzer (1973), Boettcher (1981), Kulik (1983), Duplass (1995) and Tjaden & Martin (1995); and students' learning attitudes, Kulik & Kulik (1989), the flexibility afforded through CAI may also promote another higher-order cognitive skill such as decision making, Taylor (1997) and problem solving, Renshaw (1998). What Taylor and Renshaw are putting across here is that despite the various limitations seen in PPP, the method promotes high order thinking which affects decision making in students.

Proponents of PowerPoint argue that the brain does not pay much attention to boring things, and that, what makes PowerPoint Presentations (PPP) so effective is that they add complementary, multisensory events designed to spark an emotional response among audience members, which helps maintain audience attention and improves

cognitive achievement. For instance, Naki Erdemir's experiment conducted in Turkey showed post-test score of the experimental PPP group to be higher than that of the control C&T group, Naki Erdemir; (2011) who posits that the presentation graphics (PowerPoint) method had positively affected student teachers' success in the physics course. This result has been supported by other study findings in science education such as those conducted by Kaptan and Korkmaz (2002) and Tao (2001). For example, students who listened to a narration explaining how a bicycle tire pump works while also viewing a corresponding Animation generated twice as many useful solutions to subsequent problem solving transfer questions than did students who listened to the same narration without viewing any Animation, Mayer & Anders, (1991, 1992). The results of Gier & Kreiner (2009) are also in agreement with contiguity principle of CTML which states that students better understand an explanation when corresponding words and pictures are presented at the same time than when they are separated in time like in C&T where words and illustration are presented seperately. Chandler & Sweller (1991), Sweller & Chandler (1994) Sweller, Chandler, Tierney & Cooper (1990) and Paas & Van Merrienboer (1994), had also argued that for effective learning to take place, corresponding words and pictures must be in working memory at the same time in order to facilitate the construction of referential links between them. Other proponents have indicated that, PPP, helps to keep students' interest and attention on the lecture, Szabo & Hastings (2000), improves student learning, Lowry (1999) and aids explanations of complex illustrations, Apperson, Laws, & Scepansky (2006). Another similar study conducted by Nouri and Shahid (2005) reported that students in a PowerPoint section of an Accounting Principles II class perceived higher understandability of the presented materials than their counterpart in another class. All these findings seem to agree with the CTML in that they posits that, Understanding

occurs when a visual interacts with the psychological process active in the person who receives it (Salomon, 1979).

Although most foreign researchers indicated that SPPP had more merits than 'C & T', this research intended to establish these facts from the Zambian perspective.

2.2.2. PROPONENTS OF CHALK AND TALK METHOD.

Analyses on the effectiveness of different types of visual representations done by Glenberg, Langston, Winn, Li, Schill and Dwyer concluded that if the learning time is not sufficient and appropriate, then the traditional "chalk and talk "method tend to be the most effective learning modality in as far as comprehending content is concerned Glenberg & Langston (1992), Winn, Li, & Schill (1991) and Dwyer's, (1970 & 1972). The argument put across here is that time is the most determining factor in effective learning, Glenberg & Langston (1992), Winn, Li, & Schill (1991) and Dwyer's, (1970 & 1972). Adams also added when he argued that with much time in C&T, the presenter may emphasize main points unlike PowerPoint presentation, where the presenter may point at everything as an equally weighted learning objective and thus nothing receives emphasis or priority and that this study intended to assess which teaching modality provides much time in promoting discussions and active learning in the classroom. Ainsworth, conducting a research in the United Kingdom on an analysis of Cognitive, Motor and Perceptual consequences of learning with Animations showed that, while PPP lectures may make dynamic information explicit, which should reduce the amount of cognitive effort required to learn about dynamic systems, they also on the other side, introduce significant problems for perceptual processing and memory, Ainsworth (2008). Another comparative study on PowerPoint presentation and traditional lecture methods conducted on material unerstandability, effectiveness and attitude by Daniel Sawasew, Missaye & Gebeyehu Abate (2015), indicated that lecture methods are more

helpful than PPP method. Similar studies conducted by Nouri & Shalind (2015), Susskind (2012) found similar patterns of results. Rim & Dorine (2012), observed that lectures in C&T method are well organised, easy to understand, bring material closer to students, are better structured and quickly understood. Rim & Dorine also observed that PPP method takes less time to cover more materials which affects the degree to which materials are understood, Rim & Dorine (2012). Lecture organisation, tutor and material proximity and flexibility are some of the themes this study intended to establish. Opponents of PPP method argue that PPP makes students believe that there is no need to listen attentively, which in turn make lessons more boring and students become duller than in C&T classes. In other studies Sweller and his colleagues found similar patterns of results, Bobis, Sweller & Cooper, (1993), Chandler & Sweller, (1991), referred to this as the Redundancy Effect of CTML. Stolo (1995), Susskind (2005), Szaba & Hastings (2000), Schraw (1998), Moreno & Mayer (2000), Mayer (2001), and Apperson, Laws & Scepansky (2008), seem to agree on the redundancy effect when they stated that, many PowerPoint Assisted Lectures (PPAL) reduces comprehension levels. They have argued that many courses that adopts multimedia presentations have not shown a corresponding increase in student performance. Similar are also results of Willmoth & Wybraniec (1998) and Hashmenzaden & Wilsion (2007), which showed that PPP reduces students' understandability. On learning effectiveness, Walielign's findings showed that the C&T method was more effective in the teaching and learning process than the PPP method, Walielign (2013). Hynka & Mason argued that ineffectiveness seen in PPP method could be as a result of reduced students' interactions, Hynka & Mason (1998). Rim & Dorine observed that students felt more involved and enjoyed greater level of interaction in classes taught without PPP, Rim & Dorine (2012). Pipper & Maore found that it was the use of PPP, and not the technology

itself, that lowered the quality of teacher-student relationship Pipper & Maore (1999). Parks (1999), observed that PPP made it easier for students to sleep, maybe, due to the light that it dimmed. Witt & Wheeless (2001) argued that Teacher immediacy is an effective strategy that enhances student in the US and, indicated that C&T method brings the teacher closer to the students. In most researches that have been conducted in Colleges and Universities, most lecturers have opined that PowerPoint inhibits the presenter-audience interaction, Driessnack (2005), limits the amount of detail that can be presented, Tufte (2003), and reduces a presentation's analytical quality, Stein (2006). Graphic comprehension involves several cognitive processes. First, the elements of the graphic itself must be recognized and interpreted. Next, the interpretation must be integrated with other available information, such as accompanying text or graphic labels. Finally, through inferences, a final interpretation is made, Carpenter and Shah, (1998). Brenner (1997) suggested that these processes are enhanced by the use of multiple graphic formats and, Vallance and Towndrow (2007), viewed that they can cause overload, resulting into students experiencing little deep learning. Implied here is that students learn better from a coherent summary which highlights the relevant words than from a longer version of words and pictures.

All these findings seem to agree with the CTML on Coherent and Split-Attention Principles because the on-screen text and Animation on PowerPoint presentation can overload the visual information processing system whereas narration is processed in the verbal information processing system and Animation is processed in the visual information processing system. This will limit the amount of detail, Tufte (2003) and hence reducing the analytical quality of the presentation, Stein (2006). Researchers also agrees with the Cognitive load theory (CLT), Paas, Renkl, & Sweller, (2003), which is an instructional theory that concerns the interaction between instructional information

and memory structures. It states that the way information is presented, the learning activities, and the element interactivity of the information together impose a cognitive load on learners. Ideally, the course must motivate and enthuse the students without overloading them. Ausubel (1968) has claimed that the most important single factor influencing learning is what the learner already knows. Educators should ascertain this and teach them accordingly, although the student's own motivation will also play a role. Based on the strong preference for writing on the board, it is argued that taking notes has potential benefits. Benefits like active engagement of the learner with the material and enhancing deeper understanding, and as a result it improves performance, Piolat, Olive & Kellogg (2005). Another study reported that PowerPoint presentation (PPP) may have created a generally favourable impression of the class and the professor, but not significantly affecting grades, Apperson, Laws & Scepansky (2008). Creed (1997) describes PowerPoint as a teacher-centred instructional tool that nourishes teacher-controlled lectures. Similarly, Apperson (2006), Bartsch & Coburn (2003), Beets & Lobingier (2001) Susskind (2005), and Szabo & Hastings (2000) found little effects of PowerPoint on students' academic achievement. These Researchers, contend that PPP diminishes creativity and innovation, besides, elevating format over content, betraying an attitude of commercialism that turns everything into a sales pitch, Tufte (2003). Clearly, these findings unfolds the facts that C&B is better than PPT as far as post examination performance is concerned and are also consistent with the cognitive theory of multimedia learning on one or more CTML principles.

As regard to students achievement and Gender, the following, Yusuf & Afolabi (2010), Oludipe (2012), Arigbabu & Mji (2004), David & Stanley, (2000), Din, Ming & Esther (2004), Freedman (2002) and Sungur & Tekkaya (2003), and Ogunkola & Bilesanmi-Awoderu (2000) conducted studies and have since found that there is no gender effect

on the Male and Female students taught using PowerPoint Presentations and those using the Traditional "chalk and talk" method.

Other researchers have, taken a middle way and argued that there is no statistically significant difference found on lectures taught using the chalk board or through PowerPoint Presentations. Three of such researchers are Prabhu, Pai & Prabhu (2014). In recent years, however, studies have indicated conflicting findings about PowerPoint effectiveness in improving student teaching (Craig & America, Levasseur & Sawyer (2006). However the researcher of this study have hypothesized that SPPP is more beneficial to learners than the traditional 'chalk and talk'methods on content understandability.

2.2.3. Lecturers and Students preferences to either Chalk and Talk Method or Simple PPP.

In the United States, United Kingdom and Russia, Studies on student and teacher preferences, showed contradicting results where students reported greater preference to PPP than C&T, Atkins-Sayre (1998), Daniels (1998), Sammon (1995), Beets & Lobingier (2001), Frey & Birnbaum (2002) and Perry & Perry (1998). Common themes in favour of PowerPoint included; increased convenience, focus on listening, and more accurate and readable notes, Chris Armour, Stephen Schneid and Katharina Brand (2016), argued that PPP can easily incorporate videos to enhance learning agreeing with Seth, Upadhyaya, Ahmad & Moghe (2010), who indicated that PPP is convenient (available online, less problems when missing a class, can be printed, or easier to review), it focuses on actual listening (not busy with writing notes), has better ability to see and higher accuracy of notes (fewer details missed and errors when copying hand written notes), has better Animations/visuals and are available for pre-reading, though it is a well proven fact that few learners go through their notes before a lecture.

Animated narrated videos on PPP may facilitate the asynchronous delivery of instructional content to students before engaging in active learning activities in class or lecture rooms, Johnson (2012) and Khanova, Roth, Rodgers & McLaughlin (2015). Slides can be distributed, and students will find it easier to review the material when the notes are stored on their computers. PowerPoint presentations allows students to not attend lectures and do other equally important business because the notes will be readily available. PowerPoint Presentations has the ability to focus on listening and the better comprehension of the material during lecture when they did not have to concentrate on note taking. Thus, the students' perception of the benefit of listening without note taking differs from the discussion of the studies indicating the advantages of longhand note taking discussed according to Richardson (2008).

Susskind (2005) revealed that most students and teachers preferred PPP to C&T as the method, (PPP) allowed information to be easily presented in bullet form believing that students record major points of the lecture and that it enables students to learn course materials and have high motivation to attend such classes, Sagahara & Boland (2006). Implied here is that PPP improves students' attendance. Most studies show that most students and lecturers prefer PPP to C&B due to its effectiveness as a teaching tool, Szabo & Hasting, Bartsch & Cobern, Susskind, Apperson & Sethet al (2010).

According to students who preferred PPP to the traditional "chalk and talk" method, they argued that PPP had good quality coloured 3-D diagrams, good visibility & legibility of text. Likewise clarity of words, illustrations, real pictures and summarization were some of the attributes described to be best dealt with PPP, Thomas & Appala (2007). From teacher's point, students felt that a teacher was more relaxed, as he/she could conduct the lecture even though he/she was not well prepared. So also, large material could be conveyed by this method. PowerPoint Presentation is an

important component in designing interactive multimedia which creates a visual interest and makes scientific learning more appealing and enjoyable for learners Lih-Juan ChanLin (2000). Furthermore, it adds two unique components as compared to the static graphic – motion and trajectory, Klien (1987). It requires less preparation and hence, is less strenuous for Teachers or Instructors. It presents complicated diagrams, 3-D diagrams, photographs, video-clips etc. that cannot be presented using the Traditional "chalk and talk" method, hence not limiting the material that can be conveyed to the students. PPP provides a decreased risk of missing information or copying errors as a positive effect of PowerPoint presentations. When lectures are written on the board, readability can suffer due to factors including the instructor's handwriting and size of the classroom. Other studies have also reported the advantages of the better quality of text and diagrams in PowerPoint presentations compared with whiteboard and chalkboard presentations Seth, Upadhyaya, Ahmad & Kumar (2010), Seth, Upadhyaya, Ahmad & Moghe (2010) and Shallcross & Harrison (2007). An argument that is brought forth here is that drawing skills and handwriting of the teacher is not affected by PPP, hence, PowerPoint seem to be favoured for its greater readability: both better visibility during lecture and a more accurate set of notes after lecture.

So also the condition of board and poor visibility of the text are the other noteworthy drawbacks pointed out which are not affected by the use of PPP.

In addition, a few students commented that the availability of PowerPoint slides before lecture allowed them to prepare for lectures. It prepares students for pre-reading though Davis, Hodgson & Macaulay (2012), found that only a minority of students read through lecture notes before attending a lecture.

In general, most studies have shown that students show more preference to PPP than to C&T Daniels (1999) and that is what this study intended to find out in a Zambian perspective.

2.3. DEFINITION OF TERMS AND ACRONYMS:

1.3.1 TERMS.

- **COGNITIVE LOAD-** Is where the amount of information at a time is beyond the capacity of the brain to process it.
- **GENERATIVE EFFECT-** developing images from verbal communication.
- **MULTI MEDIA-** communication containing words and pictures intended to foster learning.
- **MEANIFULL LEARNING-**learning that links education to real life experiences and gives learners skills to access, criticize, analyse and practically apply knowledge which will help them to survive in society.

2.3.2. ACRONYMS

CARIR	Computer Assistance Related Instruction Resources
C&B	Chalk and Board
CBT	Computer Based Trainings
C&T	Chalk and Talk
CLT	Cognitive Load Theory
CRP	Computer Related Presentations
CT	Cognitive theory
CTML	Cognitive Theory of Multimedia Learning

DCT	Dual Coding Theory
DPT	Depth of Processing Theory
H0	Null Hypothesis
H1	Alternative Hypothesis
ICT	Information and Communication Technology
MoGE	Ministry of General Education
LCD	Liquid Crystal Display
NGOs	Non-Governmental Organisations
OBE	Outcome Based Education
PTEC	Practically-Oriented Technical Education Curriculum
PPEFL	PowerPoint Education Facilitated Learning
PPP	PowerPoint Presentation.
PPT	PowerPoint Transmissions.
SD	Standard Deviation
SEAT	Science Education Achievement Test.
UNZA	University of Zambia
YGT	Young Generation Teachers
ZOU	Zimbabwe Open University

2.4. SUMMARY

This chapter looked at literature which was related to the research study. Related literature was studied under 3 headings namely Proponents of PowerPoint Presentations (PPP), Proponents of 'Chalk and Talk' lecture method and Lecturers and Students preferences to either Chalk and Talk Method or Simple PPP. Definitions of key terms and acronyms were also looked at in this chapter.

CHAPTER THREE

3.1. INTRODUCTION.

This chapter discusses various components like design(s), population and sampling, research instruments, data collection methods and plans, data collection procedures and data analysis procedures. The main variables identified in the study were teaching modalities. Other dependant variables included gender and different themes that emerged from the study; and to keep these variables of the study constant, both classes under study were taken by the same Educator/researcher in Science Education.

3.2 RESEARCH DESIGN(S) AND APPROACH.

A quasi-experimental design: pre-test-post-test, Non-Equivalent-Group comparative research Design was adopted in this case study. A design where non-randomized, non-equivalent, pre-test, post-test, experimental group and control group design was used to compare the effects of two lecture methods – Simple PowerPoint-assisted lecture and traditional lecture (chalk & talk) on students' content understandability for objectives 1 and 2. Two levels of independent variables (experimental and control groups), two levels of gender (Male and Female), two most preferred teaching modalities (PowerPoint presentations and the traditional "chalk & talk" methods) and fifteen themes that emerged from the lecture were investigated on students' content understandability in Science Education at Chipata College of Education. The approach taken by the study was purely quantitative. The research design layout is as in Table 3.1

Table 3.1. Research design of the study.

Table 3.1.

GROUPS	PRE-TEST	TEACHING EXPERIENCE (TREATMENT)	POST-TEST
Experimental	Pre. t# 1	PowerPoint presentations (PPP)	Post. t# 2
Control	Pre. t# 3	Usual Chalk and Talk (C & T).	Post. t# 4

Table 3.2. Research design of the study.

Table 3.2.

GROUP.	**THEMES ON A GOOD LECTURE PRESENTATION.**	
EXPERIMENTAL-PowerPoint Presentation-(PPP) GROUP	**1**	Students motivation & attendance
	2	Content & teacher immediacy
	3	Volume & clarity of illustrations
	4	Organization & students prior knowledge
	5	Creation of conducive learning environment
	6	Treatment of introductory materials.
	7	Engagement & involvement of students
	8	Teacher-learner relationship
	9	Decision making, problem solving & student's
	10	Critical thinking, Creativity & innovations
	11	Commercialism/large scale use
	12	Elevating content/material over format
	13	Originality of ideals
	14	Country's economy
	15	Flexibility & spontaneity
GROUP	**THEMES ON A GOOD LECTURE PRESENTATION.**	
CONTROL Traditional Method-C&T) GROUP.	**1**	Students motivation & attendance
	2	Content & teacher immediacy
	3	Volume & clarity of illustrations
	4	Organization & students prior knowledge
	5	Creation of conducive learning environment
	6	Treatment of introductory materials.
	7	Engagement & involvement of students
	8	Teacher-learner relationship
	9	Decision making, problem solving & student's
	10	Critical thinking, Creativity & innovations
	11	Commercialism/large scale use
	12	Elevating content/material over format
	13	Originality of ideals
	14	Country's economy
	15	Flexibility & spontaneity

3.3. POPULATION AND TARGET.

3.3.1 POPULATION.

Being the only public teachers training college offering primary diplomas in the province, Chipata College of Education has a student teacher population of 2340, of which 1170 are male student teachers and 1170 are female student teachers. Of the 2340, students, 422 male and 423 female are in their 1st year, 390 male and 390 female students are in their 2nd year; and 357 male and 358 female are in their 3rd and final year. The college has 36 classes of students and each class has an average number of 65 students of mixed sexes and performance levels. The subject areas offered by the college are maths Education, Science Education, Technology studies, literature and languages, social studies, Spiritual and Moral Education, business studies and Entrepreneurship. All the students' ages range from 18 years to 30 years.

3.3.2. TARGET.

The target group for the study was the College Administration, all Science Lecturers and all the science students. And being a primary diploma awarding college, where it is compulsory to study all study areas, the target for students was all college students.

3.4. SAMPLE SIZE.

The sample size for the study was 127, of which 58 first year students were in an experimental group (PowerPoint Presentation group) and 62 students were in the control group (The traditional 'chalk and talk' group). The sample also included 2 college administrators i.e. the college principle and the Head of Department (HOD) - Natural Sciences. Five (5) Lecturers heading the sections were also included in the sample. The sections included maths, agriculture science, physics, biology and chemistry.

3.5. SAMPLING DESIGN/ TECHNIQUE.

Purposive sampling technique was used to select the teacher college of Education in Eastern province for the study and also to select the Science Lectures and administrators. The two groups or classes, out of the 36, were randomly sampled and assigned to experimental group (PowerPoint group) and control group (The traditional "chalk and talk" group) respectively. Intact classes of the students classified into gender (Male and Female), with their own different preferences to teaching modalities (PPP and "chalk and talk"). Both the selected groups were taught the same topics in science education. The same educator was considered for both the lecture methods in order to maintain homogeneity in teaching and skill acquisition. The distribution of sample for the study is shown in Table 3.5.1.

Table 3.3. Distribution of Sample for the Study.

Table 3.3.

GROUPS	**GENDER**		**ACHIEVEMENT LEVELS**						**STUDENT PREFERENCE to PPP**	
	Male	Female	High		Medium		Low		Male	Female
			M	F	M	F	M	F		
Simple										
PPP	30	32	-	-	-	-	-	-	19	21
C&T	29	29	-	-	-	-	-	-	30	12

From **Table 3.3,** the groups comprised a total number of 120 students; of which 62 students were taught science Education using PowerPoint presentation (PPT) (Experimental Group), and 58 students were exposed to "Chalk and Talk" method as a normal medium of instruction (Control group).

3.6. CASE STUDY TREATMENT MATERIALS.

The PowerPoint (PPP) with the Science Education contents was presented using a Lenovo (windows 8.1) laptop make and a Liquid Crystal Display (LCD) projector. The Educator/researcher presented information and displays of the contents in a 2-dimimensional view to the students using PPP on each of the stated units and topics in Science Education for an average period of 6 weeks. The topics were on the Human body and the environment. Other revision topics included plants and sensory organs.

The C&T lecture delivery method was composed of the traditional presentation (i.e., lecture without slides) and included the lecture and the chalkboard presentation, which is often referred to as a "chalk-and-talk". It included writing on the black/white board, traditional/conventional methods, direct speech, and other basic materials in the classroom during regular course lectures. Other course materials were verbally presented in the lecture. Graphs and figures were drawn on the black/white board whenever illustrations were needed. There was no other equipment used for presentation of the information to the control group.

The Simple PowerPoint lectures consisted of the instructor and the corresponding visual presentations. The presentations were reflected from a laptop on to the screen using PowerPoint software. Only basic text and diagrams related to the topic were explained on the chalk board or white board. The majority of the material were presented on the laptop and presentations were supported verbally in order to teach the sample students in a more comprehensive manner.

The same topics were taught to both groups by the same instructor and on the scheduled times and days according to the College Science Education time tables. The Educator/researcher used the same textbooks, tests, and lecture materials during the instruction; the only difference in the experimental group was the use of PPPT as a

supplement to the traditional lecture. It took six weeks for the Educator/Researcher to conclude, summarize and recapitalize the given topics in both groups.

3.7. DATA COLLECTION INSTRUMENTS, PROCEDURE AND PLAN.

3.7.1 RESEARCH INSTRUMENTS.

The Science Education Achievement Test (SEAT) and an Attitude Scale/Questionnaire are instruments which were used to collect data from the sample. Science Education Achievement Test (SEAT) was a researcher-developed instrument which was used to asses students comprehension in the process of collecting data for the study. The SEAT consisted of two section i.e. 1 and 2. Section 1 was used to elicit students' bio-data such as name of college, student's class, gender (sex), and age of students. Section 2 of the SEAT consisted of a 25-multiple-choice test items with four options (A-D). Apart from the SEAT, an Attitude Scale/Opinionnaire was also used to elicit data in form of students' opinions of their preferences to the two teaching methods (PPP and C&T). Like the SEAT, the Attitude Scale/Opinionnaire had equally section 1 and 2. Section 1 was used to elicit students' bio-data such as name of college, student's class, gender (sex), and age of students. Section 2 of the attitude scale/opinionnaire consisted of a 15 theme items on which students gave their opinions. To have precision and high levels of specificity on students opinions, each theme was assessed on a 5-point Scale, **5** being (**strongly agree**) and **1** being (**strongly disagree**). Both sample groups consisted of 114 students and each sample student completed the tests.

3.7.2. DATA COLLECTION PROCEDURES.

To ascertain the equivalence of the students in the experimental (PPP) group and the control (C&T) group, the educator/researcher administered two SEATs on sample students as pre-test and post-test respectively. A SEAT Pre.t#1 and Pre.t#3 were administered respectively before the treatment. The treatment (teaching experience) on

the Experimental group followed immediately while the control group maintained its usual C&T Method; thereafter a SEAT Post.t#2 and Post.t#4 followed as post-test to the sample students in each group in order to collect Data which was used to assess objectives 1 and 2. Each question had one correct answer among the four options & each correct answer was awarded one mark, making the Maximum mark to be – (25) and minimum mark to be- (0). The Attitude Scale/Opinionnaire which consisted 15 theme items was equally administered to both the experimental group and control group to collect Data for assessing objective 3. To have precision and high levels of specificity on students opinions, each theme was assessed on a 5-point Scale, **5** being (**strongly agree**) and **1** being (**strongly disagree**). The two researcher developed instruments - the SEAT and an Attitude Scale/Opinionnaire were administered to the sample to assist elicit Data for the research study. Data was collected from both scores of the SEATs and their (students) opinions from the Attitude Scale/Opinionnaire.

3.7.3. DATA COLLECTION PLAN.

On average, the study lasted for six weeks. Within that time flame, 2 instruments - the SEAT and an Attitude Scale/Opinionnaire were administered to the sample students. The Data collection plan is shown in Table 3.4.

Table 3.4. Data collection plan for the study.

GROUPS	**PRE-TEST**	**TEACHING EXPERIENCE (TREATMENT) and Administration of the attitude scale/Opinionnaire.**	**POST-TEST**
	Week 1.	**Week 2 - 5.**	**Week 6**
Experimental	Pre. t# 1	PowerPoint presentations (PPP)	Post. t# 2
Control	Pre. t# 3	Traditional chalk and talk method	Post. t# 4

3.8. DATA ANALYSIS PROCEDURES.

Collected data was analysed, based on the stated objectives, by using descriptive and inferential statistics. Percentages, mean Scores, standard deviation, z- scores and t-test were used for describing the findings of the study.

Graphical representations were also used to show some visual illustrations

3.9. VALIDITY AND RELIABILITY OF INSTRUMENTS.

Study instruments were validated through member checking and triangulation.

3.10. LIMITATIONS OF THE STUDY:

The researcher wanted to cover as many colleges and universities as possible country-wide in order to even make some more deepened and broaden comparative evaluation of the effects of PowerPoint presentations (SPPP) as opposed to the Traditional "chalk and talk" method on students' content understandability through their achievement results. However, the study was conducted only at one college (Chipata College of Education), whose findings were less generalizable to other parts of the country since the sample was not a true representation of the population (Colleges and Instructors).

Secondly, writing on the board in itself has a number of variables. Different people use the board in different ways ranging from writing down a detailed outline format to only writing key points, as was used in this study, which again might give less generalisations to other parts of the country.

Lastly, students perspectives on the two methods would give a wider variability in terms of preferences on emerging themes, hence a limitation of the study, more especially that students in Simple PPP class gave their opinions on different themes of using PPP together with a non specified group of class "C&T" that did not use PowerPoint, which certainly introduced a wider variability in terms of preferences, hence limiting the study.

3.11. DELIMITATION OF THE STUDY:

The research study was conducted at Chipata College of Education in Chipata, Eastern province.

3.12. ETHICAL ISSUES.

During the course of the study, the sample students were briefed about the research study and an appeal was made for them to participate fully. Data was collected by self-report method. Written consent was obtained from study subjects areas. Ethical clearance was obtained from ethics committee of UNZA and the confidentiality of data that was collected from students, lecturers and administrators was maintained.

3.13. SUMMARY ON RESEARCH METHODOLOGY.

This chapter discussed the research methodology to the study. The components discussed included introduction, research design(s), population and sampling, research instruments, data collection methods and plans, data collection procedures and data analysis procedures. The research methodology is summarised in table 3.5, below.

Table 3.5 Summary on Methodology.

Table 3.5

3.1	INTRODUCTION.	Given.
3.2	RESEARCH DESISN AND APPROACH.	Case study design and took the Quantitative Approach.
3.3	POPULATION & TARGET	Population: 2340 students & 33 lectures
		Target: 2340 students & 33 lectures
3.4	SAMPLE SIZE.	120 students & 7 lectures
3.5	DESIGN/ TECHNIQUE	Purposive and Random
3.6	TREATMENT MATERIALS	Lenovo (window 8.1) lap top, Liquid Crystal Display LCD Projector
3.7	DATA COLLECTING	Instruments: Science Education Achievement Test SEAT and an attitude scale chart.
		Procedure: SEAT and attitude scale chart administration.
		Plan: SEAT before and after the treatment, Attitude Scale; after the treatment.
3.8	DATA PRESENTATIONS.	Percentages, mean Scores, SD, T and Z Scores. Also graphic presentations.
3.9	VALIDITY AND RELIABILITY.	Member checking and Triangulations.
3.10	STUDY LIMITATION.	• Research conducted at one College Institution.

		• Using one Lecturer in both groups. • Writing on the board which has several variables.
3.11	STUDY DELIMITATION.	The study delimitated itself to the three major variables i.e. Students understandability, 'C & T' and Simple PPP.
3.12	ETHICAL ISSUES.	• Written consent obtained from relevant authorities. • Ethical clearance obtained from Ethics Committee (UNZA). • Students briefed about the Study. • Confidentiality of Data was kept.

CHAPTER FOUR.

4.1 INTRODUCTION:

In this chapter data will presented, analysed and interpreted using the research study objectives and emerged themes.

4.2 DATA PRESENTATION:

Data was presented using both Measures of Dispersion (SD) and Measures of Relative Standing (T and Z) Scores. Graphic presentations were, like pie charts and bar charts, were also used for visual illustrations.

FINDINGS FOR OBJECTIVE 1.

To determine whether there is a statistical difference in the mean scores of students taught Science Education using PowerPoint Presentations (PPP) and those taught with the Traditional "chalk and talk" method.

Table 4.1 Percentage means for the Control group ('chalk & talk') by Gender.

Table 4.1.

GROUP	GENDER	PRE-TEST	AVERAGE
'C & T'	Male	50.29%	47.38%
'C & T'	Female	40.69%	

Figure 4.1. Graphical illustration of percentage means for the Control group ('chalk & talk') by Gender.

Figure 4.1

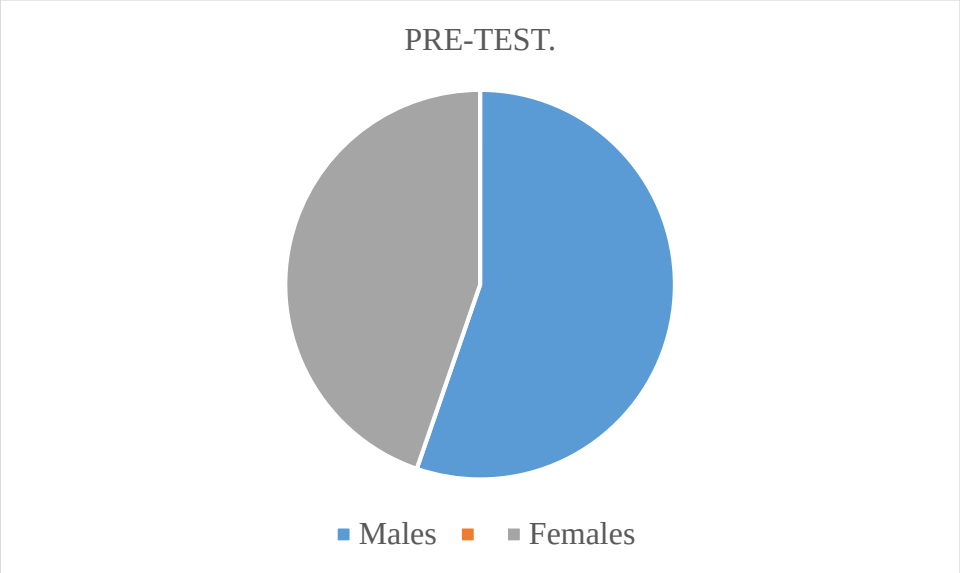


Table 4.2 Percentage means for the Experimental group ('SPPP') by Gender.

Table 4.2.

GROUP	GENDER	PRE-TEST	AVERAGE
'SPPP'	Male	57.38%	49.08%
'SPPP'	Female	40.93%	

Figure 4.2. Graphical illustration of percentage means for the Experimental group ('SPPP') by Gender.

Figure 4.2

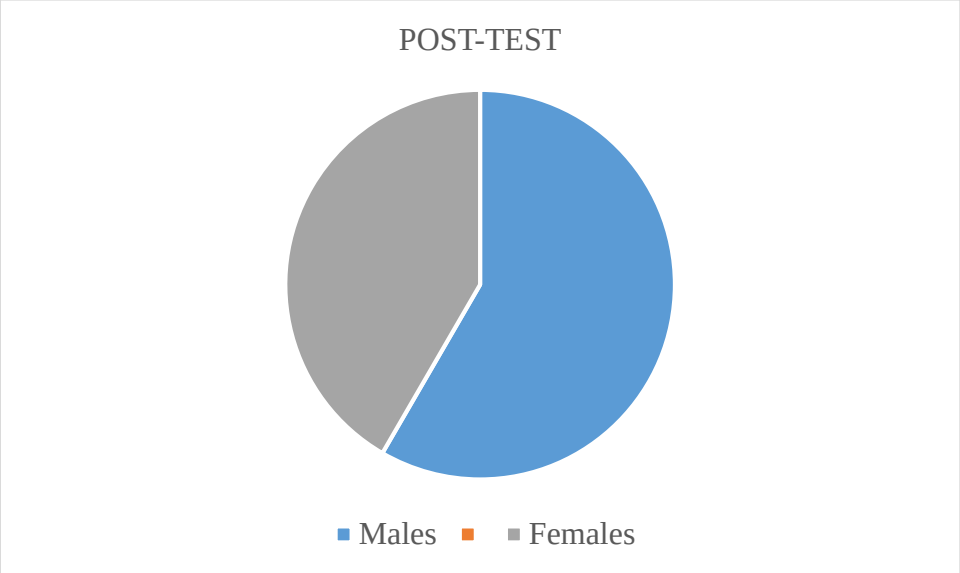


Table 4.3. Mean Scores, SD, T and Z scores for students in both the Experimental and Control group.

Table 4.3.

TYPE OF MEASURE.	TRADITIONAL "CHALK AND TALK" METHOD.	POWERPOINT PRESENTATIONS (PPP)
Mean Score	58	62
Standard Deviation	18.97	42.05
Z – Scores	0.40	0.10
T – Scores	54	51

FINDINGS FOR OBJECTIVE 2.

- To determine whether there is a statistical difference in the mean scores of male and female students taught Science Education using the traditional 'Chalk & Talk' method and simple PowerPoint Presentation (PPP).

Table 4.4. Percentage means for the traditional 'Chalk & Talk' method by gender.

Table 4.4.

GROUP	GENDER	PRE-TEST MEAN	POST-TEST MEAN	MEAN INCREASE.
Traditional 'Chalk & Talk' Method	M	50.30%	57.40%	7.08
	F	40.70%	40.90%	0.23

Figure 4.3. Graphical illustration of percentage mean increase for the Control group ('chalk & talk') for males.

Figure 4.3.

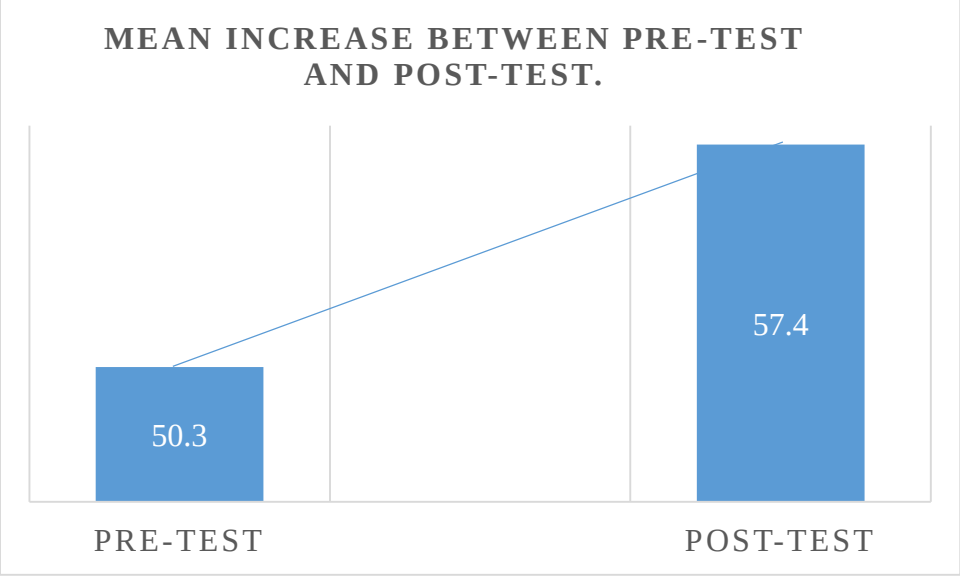


Figure 4.4. Graphical illustration of percentage mean increase for the Control group ('chalk & talk') for females.

Figure 4.4.

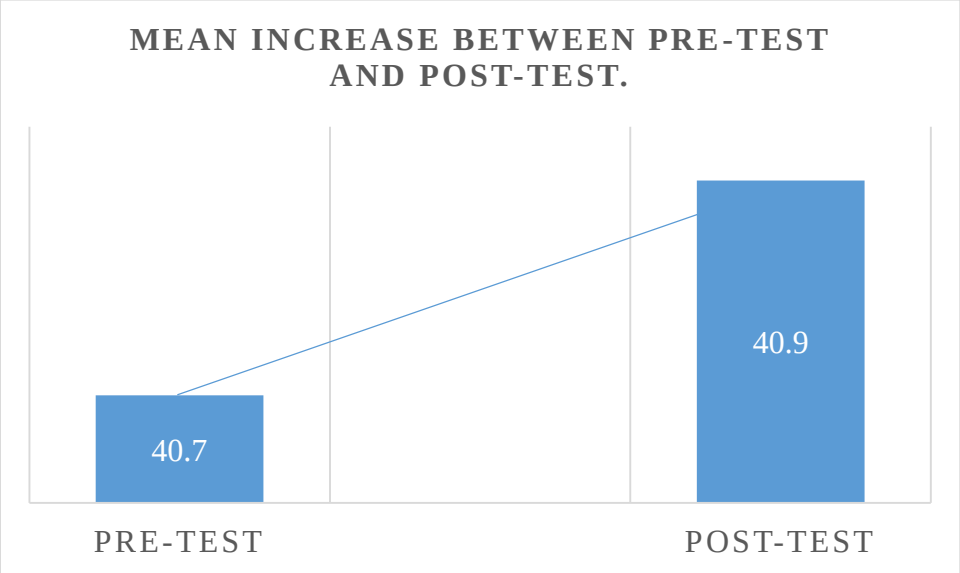


Table 4.5. Mean Scores, SD, T and Z- Scores for students in the Control group by Gender.

Table 4.5.

TYPE OF MEASURE.	**TRADITIONAL "CHALK AND TALK" METHOD.** (MALE).	**TRADITIONAL "CHALK AND TALK" METHOD.** (FEMALE).
Mean Score	57.38	40.93
Standard Deviation	14.41	26.11
Z – Scores	-1.97	-0.46
T – Scores	30	45

FINDINGS FOR OBJECTIVE 2, CONTINUES.

Percentage means for the PowerPoint Presentation method in Table 4.6.

Table 4.6.

GROUP	GENDER	PRE-TEST MEAN	POST-TEST MEAN	MEAN INCREASE.
POWERPOINT PRESENTATION	M	41.80%	53.33%	11.53%
	F	40.10%	61.12%	21.02%

Figure 4.5. Graphical illustration of percentage mean increase for the Experimental group ('SPPP') for males.

Figure 4.5.

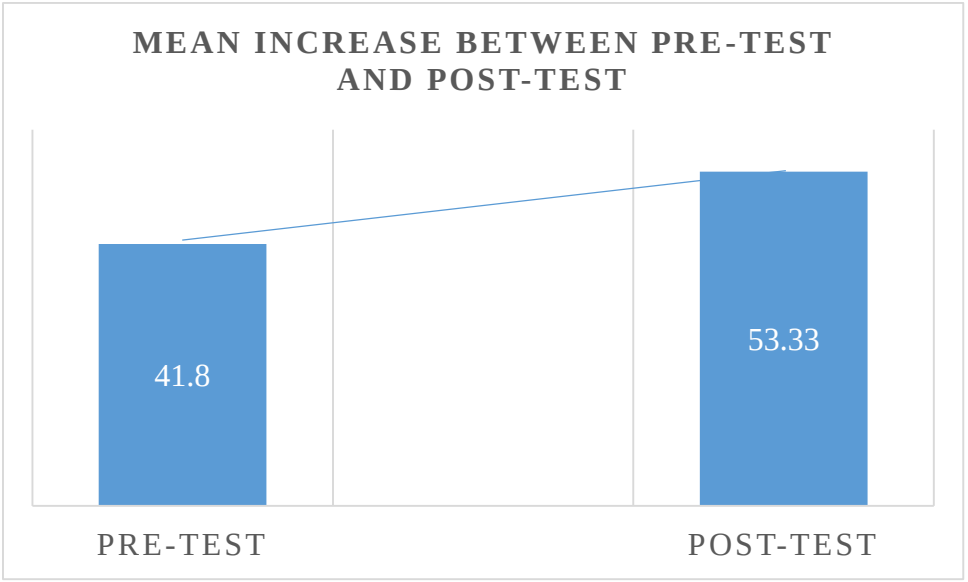


Figure 4.6. Graphical illustration of percentage mean increase for the Control group ('chalk & talk') for females.

Figure 4.6.

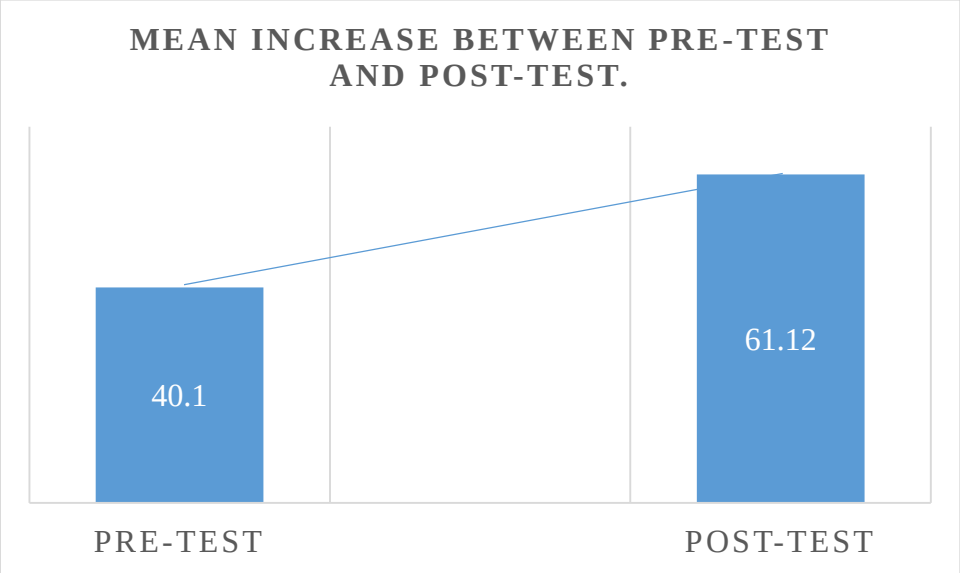


Table 4.7. Mean Scores, SD, T and Z scores for students in an experimental group by Gender.

Table 4.7.

TYPE OF MEASURE.	**POWERPOINT PRESENTATIONS (PPP)** (MALE)	**POWERPOINT PRESENTATIONS (PPP)** (FEMALE)
Mean Score	53.33	61.12
Standard Deviation	27.85	11.01
Z – Scores	-0.84	-2.64
T – Scores	42	24

FINDINGS FOR OBJECTIVE 3.

- To explore students perspectives on the use of PowerPoint presentation method in the teaching of Science Education.

Table 4.8. Students' perspectives about Simple PPP Method (Experimental group)

(5) Strongly agree. (1) Strongly disagree.

PARMETERS OF A GOOD LECTURE	MALES		FEMALES	
	5	**1**	**5**	**1**
Promotes students' Motivation and Attendance.	21	4	23	6
Brings content and Lecturer closer to the students.	11	10	14	12
The method covers a big volume of content and clarity of illustrations is excellent.	15	8	14	7
It has a good organization of tasks.	12	12	14	13
The method creates a conducive learning atmosphere.	18	2	15	8
There is good introduction of the topic.	2	18	6	20
Students' engagement and involvement is good in SPPP.	10	14	11	18
It creates a good rapport between the tutor and student.	10	4	12	8
Facilitate decision making and problem solving	4	6	8	8
Can be used on a large scale	20	1	26	4
It elevates content over format	4	18	9	20
Originality of ideas well presented in SPPP	8	4	10	9
The method has less effect to country's economy.	8	14	8	16
The method is flexible and spontaneous	10	9	13	9

It enhances critical thinking, creativity and innovations.	14	9	14	12

From the experimental group, only 58 out of 62 filled in the opinion scale chart. 3 males and 1 female student were absent.

Table 4.9. Students' perspectives about Simple PPP Method (Control group)

(5) Strongly agree. (1) Strongly disagree.

PARMETERS OF A GOOD LECTURE	MALES		FEMALES	
	5	**1**	**5**	**1**
Promotes students' Motivation and Attendance.	20	6	16	11
Brings content and Lecturer closer to the students.	13	12	13	14
The method covers a big volume of content and clarity of illustrations is excellent.	18	9	20	5
It has a good organization of tasks.	14	10	16	9
The method creates a conducive learning atmosphere.	14	11	14	13
There is good introduction of the topic.	13	12	13	13
Students' engagement and involvement is good in SPPP.	11	11	13	11
It creates a good rapport between the tutor and student.	18	4	16	6
Facilitate decision making and problem solving	6	4	8	7
Can be used on a large scale	24	3	21	6
It elevates content over format	10	9	8	9
Originality of ideas well presented in SPPP	9	10	11	15
The method has less effect to country's economy.	11	5	13	6
The method is flexible and spontaneous	8	19	4	21
It enhances critical thinking, creativity and innovations.	13	13	14	13

From the control group, only 56 out of 58 filled in the opinion scale chart. 1male and 1 female student were absent.

Table 4.10. Scores of students' perspectives on different themes of the Lecture.

PARMETERS OF A GOOD LECTURE	PPP Scores (%)		'C & T' Scores (%)	
Promotes students' Motivation and Attendance.	76	17	64	30
Brings content and Lecturer closer to the students.	43	38	46	47
The method covers a big volume of content and clarity of illustrations is excellent.	50	27	68	25
It has a good organization of tasks.	45	43	54	34
The method creates a conducive learning atmosphere.	58	17	50	43
There is good introduction of the topic.	13	65	46	45
Students' engagement and involvement is good in SPPP.	36	54	43	39
It creates a good rapport between the tutor and student.	38	21	61	18
Facilitate decision making and problem solving	20	24	25	20
Can be used on a large scale	79	9	81	16
It elevates content over format	22	62	33	32
Originality of ideas well presented in SPPP	30	22	36	45
The method has less effect to country's economy.	27	52	43	20
The method is flexible and spontaneous	40	26	22	72
It enhances critical thinking, creativity and innovations.	49	36	48	46

4.3. DATA ANALYSIS AND INTERTPRETATION:

4.3.1. DATA ANALYSIS AND INTERPRETATION FOR OBJECTIVE 1:

Figure 4.1 and 4.2 shows that Simple PowerPoint presentation method had a high mean gain scores of 3.31; followed by chalk and talk method with a mean gain of 1.89. This shows that both groups benefited from the treatment, with simple PowerPoint presentation having the highest performance mean (49.08%) than those taught using 'C & T' method (47.38%).

Table 4.3 shows the SD of Simple PPP (42.05) and the SD of C & T (18.97). This shows that in Simple PPP the scores of the students are more spread out of the Mean than in C & T Method since the measures are less similar. The same table (Table 4.3) shows the Z- Score of the Simple PPP students to be 0.10 while that of C & T students was 0.40. This shows that performance of students in Simple PPP is better than students in C & T class since 0.10 is closer to the Mean than 0.40. The T- Scores from the table shows the positions of the scores in Simple PPP (51) and the C & T (54). This shows that Simple PPP is on position 51 while C & T on position 54.

4.3.2. DATA ANALYSIS AND INTERPRETATION FOR OBJECTIVE 2:

I. Comparison of male and females results in "C & T" Method.

Table 4.4 shows results in a "C & T" presentation method for both male and female students. The male students had a high mean scores of 57.38% compared to the female students with the average mean score of 40.93%. This shows that both sexes benefited from the treatment which used "C & T" Method since in both sexes there was a mean increase. In males, the mean increase between pre-test and post-test scores was 7.08 while in females, the mean increase between pre-test and post-test scores was 0.23 which was not very noticeable even with the graphical presentation in figure 4.3 and figure 4.4.

Table 4.5 also shows the SD of "C & T" Method of males (14.41) and the SD of "C & T" of females (26.11). This shows that in "C & T" Method the scores of the male students are more spread out of the Mean than female students since the measures are less similar. The same table (Table 4.6) shows the Z- Score of the "C & T" Method of male students to be -1.97 while that of "C & T" female students was -0.46. This shows that performance of Female students in "C & T" is better than Male students since (0.10) is closer to the Mean than (-1.97). The T- Scores from the table shows the positions of the scores in "C & T" males (30) to the mean of 57.38 and "C & T" Females (45) to the mean of 40.93.

II. Comparison of male and females results in Simple PPP Method.

Table 4.6 shows Simple PowerPoint presentation method for both males and female. Females had a high mean gain scores of 21.02 between the pre-test and post-test score results compared to the male students mean increase or gain which was 11.53. This shows that both sexes benefited from the treatment using Simple PPP, with Female students having the highest performance mean (61.12%) than Male student who had a mean of (53.33%). The difference is seen in figure 4.5 and 4.6.

Table 4.7 shows the SD of Simple PowerPoint presentation Method of males (27.85) and the SD of Simple PowerPoint presentation Method of females (11.01). This shows that the scores of the female students are more spread out of the Mean than male students since the measures are less similar. The same table (Table 4.7) shows the Z- Score of the Simple PPP Method of male students to be -0.84 while that of female students was (-2.64). This shows that performance of Male students in Simple PPP is better than Female students since (-0.84) is closer to the Mean than (-2.64). The T- Scores from the

table shows the positions of the scores in Simple PowerPoint presentation method for males (42) to the mean of 53.33% and Females (45) to the mean of 61.12%.

4.3.3 DATA ANALYSIS AND INTERPRETATION FOR OBJECTIVE 3:

Table 4.10 shows results of students opinions as regards to Simple PPP Method analysed from various parameters of a good lecture.

a) Promotes students' Motivation and Attendance.

Table 4.10 shows that 76% of the students from the Experimental group strongly agreed that simple PPP promotes students' Motivation and Attendance while 17% strongly disagreed the statement that simple PPP promotes students' Motivation and Attendance. From the Control group 64% of the students strongly agreed that simple PPP promotes students' Motivation and Attendance while 30% strongly disagreed the statement that simple PPP promotes students' Motivation and Attendance. This shows that most students from both groups agreed that Simple PPP promotes students' Motivation and Attendance.

b) Brings content and Lecturer closer to the students.

Table 4.10 shows that 43% of the students from the Experimental group strongly agreed that simple PPP brings content and Lecturer closer to the students while 38% strongly disagreed the statement that simple PPP brings content and Lecturer closer to the students . From the Control group 46% of the students strongly agreed that simple PPP brings content and Lecturer closer to the students while 47% strongly disagreed the statement that simple PPP brings content and Lecturer closer to the students. This shows that on average, students from both groups agreed and disagreed that simple PPP brings content and Lecturer closer to the students.

c) **Covers a big volume of content and clarity of illustrations is excellent**.

Table 4.10 shows that 50% of the students from the Experimental group strongly agreed that simple PPP covers a big volume of content and clarity of illustrations is excellent while 27% strongly disagreed the statement that simple PPP covers a big volume of content and clarity of illustrations is excellent. From the Control group 68% of the students strongly agreed that simple PPP covers a big volume of content and clarity of illustrations is excellent while 25% strongly disagreed the statement that simple PPP covers a big volume of content and clarity of illustrations is excellent. This shows that most students from both groups agreed that Simple PPP covers a big volume of content and clarity of illustrations is excellent.

d) Has a good organization of tasks.

Table 4.10 shows that 45% of the students from the Experimental group strongly agreed that simple PPP has a good organization of tasks while 43% strongly disagreed the statement that simple PPP has a good organization of tasks. From the Control group 54% of the students strongly agreed that simple PPP has a good organization of tasks while 34% strongly disagreed the statement that simple PPP has a good organization of tasks. This shows that on average, students from both groups agreed and disagreed that simple PPP has a good organization of tasks.

e) Creates a conducive learning atmosphere.

Table 4.10 shows that 58% of the students from the Experimental group strongly agreed that simple PPP creates a conducive learning atmosphere while 17% strongly disagreed the statement that simple PPP creates a conducive learning atmosphere. From the Control group 50 % of the students strongly agreed that simple PPP creates a conducive learning atmosphere while 43% strongly disagreed the statement that simple PPP

creates a conducive learning atmosphere. This shows that most students from both groups agreed and disagreed that simple PPP creates a conducive learning atmosphere.

f) Make good introduction of the topic.

Table 4.10 shows that 65% of the students from the Experimental group strongly agreed that simple PPP makes good introduction of the topic while 13% strongly disagreed the statement that simple PPP makes good introduction of the topic. From the Control group 46% of the students strongly agreed that simple PPP makes good introduction of the topic while 45% strongly disagreed the statement that simple PPP makes good introduction of the topic. This shows that most students from both groups disagreed that Simple PPP makes good introduction of the topic.

g) Students' engagement and involvement is very good

Table 4.10 shows that 36% of the students from the Experimental group strongly agreed that in simple PPP students' engagement and involvement are very good while 54% strongly disagreed the statement that in simple PPP students' engagement and involvement are very good. From the Control group 43% of the students strongly agreed that in simple PPP while 39% strongly disagreed the statement that in simple PPP students' engagement and involvement are very good. This shows that most students from both groups disagreed that in Simple PPP students' engagement and involvement are very good.

h) Creates a good rapport between the Lecturer and the Students.

Table 4.10 shows that 38% of the students from the Experimental group strongly agreed that simple PPP creates a good rapport between the lecturer and the students while 21% strongly disagreed the statement that simple PPP creates a good rapport between the lecturer and the students. From the Control group 61% of the students strongly agreed

that simple PPP creates a good rapport between the lecturer and the students while 28% strongly disagreed the statement that simple PPP creates a good rapport between the lecturer and the students. This shows that most students from the Control group disagreed that Simple PPP creates a good rapport between the lecturer and the students.

i) Facilitates decision making and problem solving

Table 4.10 shows that 20% of the students from the Experimental group strongly agreed that simple PPP facilitates decision making and problem solving in students while 24% strongly disagreed the statement that simple PPP facilitates decision making and problem solving in students. From the Control group 25% of the students strongly agreed that simple PPP facilitates decision making and problem solving in students while 20% strongly disagreed the statement that simple PPP facilitates decision making and problem solving in students. This shows that most students from both groups did not have strong opinions on whether to agree or disagree with the statement that Simple PPP facilitates decision making and problem solving in students.

J) Originality of ideas is well presented

Table 4.10 shows that 79% of the students from the Experimental group strongly agreed that in simple PPP originality of ideas are well presented while 9% strongly disagreed the statement that in simple PPP originality of ideas are well presented. From the Control group 81% of the students strongly agreed that in simple PPP originality of ideas are well presented while 16% strongly disagreed the statement that in simple PPP originality of ideas are well presented. This shows that most students from both groups agreed that in Simple PPP originality of ideas are well presented.

k) Elevates content/ material over format

Table 4.10 shows that 22% of the students from the Experimental group strongly agreed that simple PPP elevates content/ material over format while 62% strongly disagreed the statement that simple PPP elevates content/ material over format. From the Control group 33% of the students strongly agreed that simple PPP elevates content/ material over format while 32% strongly disagreed the statement that simple PPP elevates content/ material over format. This shows that most students from the Experimental group disagreed that Simple PPP elevates content/ material over format.

l) The method is cheap and does not affect the country's economy very much.

Table 4.10 shows that 30% of the students from the Experimental group strongly agreed that simple PPP is cheap and does not affect the country's economy very much while 22% strongly disagreed the statement that simple PPP is cheap and does not affect the country's economy very much. From the Control group 36% of the students strongly agreed that simple PPP is cheap and does not affect the country's economy very much while 45% strongly disagreed the statement that simple PPP is cheap and does not affect the country's economy very much. This shows that most students from both groups did not have strong opinions on whether to agree or disagree with the statement that Simple PPP is cheap and does not affect the country's economy very much.

m) Can be used on a very large scale i.e. with very big classes.

Table 4.10 shows that 52% of the students from the Experimental group strongly agreed that simple PPP can be used on a very large scale while 27% strongly disagreed the statement that simple PPP can be used on a very large scale. From the Control group 43% of the students strongly agreed that simple PPP can be used on a very large scale while 20% strongly disagreed the statement that simple PPP can be used on a very large

scale. This shows that most students from the Experiment group disagreed that Simple PPP can be used on a very large scale.

n) The method is flexibility and spontaneous

Table 4.10 shows that 40% of the students from the Experimental group strongly agreed that simple PPP is flexible and spontaneous while 26% strongly disagreed the statement that simple PPP is flexible and spontaneous. From the Control group 22% of the students strongly agreed that simple PPP is flexible and spontaneous while 72% strongly disagreed the statement that simple PPP is flexible and spontaneous. This shows that most students from the control group disagreed that Simple PPP is flexible and spontaneous.

o) Enhances critical thinking, creativity and innovations in students.

Table 4.10 shows that 49% of the students from the Experimental group strongly agreed that simple PPP enhances critical thinking, creativity and innovations in students while 36% strongly disagreed the statement that simple PPP enhances critical thinking, creativity and innovations in students. From the Control group 48% of the students strongly agreed that simple PPP enhances critical thinking, creativity and innovations in students while 46% strongly disagreed the statement that simple PPP enhances critical thinking, creativity and innovations in students. This shows that most students from both groups did not have strong opinions on whether to agree or disagree with the statement that Simple PPP enhances critical thinking, creativity and innovations in students.

CHAPTER FIVE

5.1 INTRODUCTION

This unit discusses the research study findings, Educational implications, conclusions and the recommendations.

5.2 DISCUSSIONS

Discussions for objective 1:

- To determine whether there is a statistical difference in the mean scores of students taught Science Education using PowerPoint Presentations (PPP) and those taught with the Traditional "chalk and talk" method.

The results of objective 1 shows that there was a mean increase in the achievement scores of the group taught science education concepts using PPP. The Z- Score of the Simple PPP students was 0.10 while that of C & T students was 0.40. This shows that performance of students in Simple PPP was better than students in C & T class since 0.10 is closer to the Mean than 0.40. The T- Scores from the findings showed the positions of the scores in Simple PPP to be (51) and that of ("C & T") was (54). This shows that Simple PPP is on position 51 while C & T on position 54. Position 51 is closer to the mean than 54. This result agrees with the findings of (Gier & Kreiner, 2009) and (Nouri & Shahid, 2005) who both established that simple PPP increases student's retention and understandability. The results also agrees with the Dual-Coding Theory (Paivio, 1986), which states that visual and verbal information are processed in distinct channels and in view of this, it has been widely agreed by educators that teaching or learning materials containing both verbal and visual modes of information should improve learning. It is also consistent with the Multiple Representation Principle of the CTML which states that it is better to present an explanation in words and pictures

than solely in words only. This principle is simply saying that it is better to present an explanation using two modes of representation rather than one.

However, the study results disagrees with (Leslie, Low, Jin & Sweller, 2012) findings which showed that audio–visual presentations was only beneficial for older students. The results also disagrees with Dudley, Shallcross & Timothy Harrison (2006) who found that the method of delivery has no significant impact on the outcomes and with Rokade & Bahetee (2013) who felt that 'C & T' was better than PPP judging from the examination performance which was said to be the end product of conceptual understanding, memory retention and reproduction of diagrams.

Discussions for objective 2:

- To determine whether there is a statistical difference in the mean scores of male and female students taught Science Education using the traditional 'Chalk & Talk' method and simple PowerPoint Presentation (PPP).

The results of objective 2 shows that there was a mean increase for both sexes in the achievement scores of both groups taught science education concepts using 'C & T' and simple PPP. This shows that both sexes benefited from the treatments of "C & T" and Simple PPP which were used, although with a very small and unnoticeable difference in favour of female's students in 'C & T' looking at their Z-scores. In "C & T", Z-scores for females is (-0.10) and males is (-1.97). On the other hand there was a very small and unnoticeable difference in favour of male's students in Simple PPP looking at their Z-scores. In "C & T", Z-scores for males is (-0.84) and females is (-2.64). The results of objective 2 shows that there is no gender effect on the achievement of male and female students taught Science Education concepts with Simple PPP. This finding is in agreement with the results of Ogunkola and Bilesanmi-Awoderu (2000) who carried

out research on the effectiveness of two teaching methods on students' achievement in Biology and found that their achievement was not sensitive to gender. The findings also agree with Gambari (2010), Oludipe (2012) and Yusuf and Afolabi (2010) which showed that gender had no influence on students' performance in physics, biology and basic science respectively. The results are also consistence with Szabo & Hastings (2000) who found neither a positive nor a negative effect of using any electronic Media in teaching and learning. As regard to students achievement and Gender, the research findings for this study agrees with the following, Yusuf & Afolabi (2010), Oludipe (2012), Arigbabu & Mji (2004), David & Stanley, (2000), Din, Ming & Esther (2004), Freedman (2002) and Sungur & Tekkaya (2003), and Ogunkola & Bilesanmi-Awoderu (2000) conducted studies and have since found that there is no gender effect on the Male and Female students taught using PowerPoint Presentations and those using the Traditional "chalk and talk" method.

Discussions for objective 3:

- To explore students perspectives on the use of PowerPoint presentation method in the teaching of Science Education.

The results of objective 3 shows that 45% of the students on average strongly agreed in all parameters studied that Simple PPP Method is more helpful than 'C & T' which had 35% of the students with strong agreements. 20% of the students in both groups had very weak agreements or disagreements on either Simple PPP Method or 'C & T' in the parameters identified in the study.

Majority of students (76%) expressed that the Simple PPP promotes students' Motivation and Attendance. This finding is in agreement with the work of Bartsch & Cobern (2003), and Gonen & Basaran (2008), who expressed that PowerPoint-Aided Education Facilitated Learning (PPEFL), attracted students' attention and enhanced

motivation. However, the finding disagrees with Parks (1999), who observed that PPP was boring and its colour made it easier for students to sleep, due to the light that it dimmed. Fifty percent (50%) of the students opined for Simple PPP because it covers a big volume of content and that clarity in Simple PPP is excellent which is in agreement with Rim & Dorine (2012) who observed that PPP method takes less time to cover more materials, and also observed that this affected the degree to which materials are understood and 45% strongly agreed that Simple PPP has a good organization of tasks. 58% of the students strongly agreed that Simple PPP creates a conducive learning atmosphere. This finding agrees with Apperson, Laws & Scepansky (2008) who observed that Simple PPP may create a generally favourable impression of the class and the professor, but not significantly affecting grades. The majority of students (79%) again expressed that in Simple PPP, originality of ideas are well presented. This finding is supported by Chandler & Sweller (1991), Sweller & Chandler (1994) Sweller, Chandler, Tierney & Cooper (1990) and Paas & Van Merrienboer (1994), who had argued that originality is vital for effective learning. For effective learning to take place, corresponding words and original pictures must be in working memory at the same time in order to facilitate the construction of referential links between them. The finding is also supported by the Dual-Coding Theory (Paivio, 1986). According to the Dual-Coding Theory of (Paivio, 1986), which states that visual and verbal information are processed in distinct channels. However, in disagreement with the study, Vallance and Towndrow (2007) viewed that multiple graphic formats can cause overload, resulting into students experiencing little deep learning. And 41% of the students opined for Simple PPP enhances critical thinking, creativity and innovations in students agreeing with both Taylor (1997) on the promotion of another higher-order cognitive skill such as decision making and Renshaw (1998) problem solving.

On the other hand, the majority of students (65%) expressed that 'C & T' Method makes good introduction of the topic. This result agrees with Kalyuga (2011), Paas & Ayres (2014) and Sweller (1994). They all argued that writing on the board uses a more appropriate pace which is vital in introducing a topic or concept to students. The implication here is that the instructor or teacher will, generally move through the content at a slower pace compared with reading and clicking through PowerPoint slides as information can only be taught as fast as the instructor can write. On "C&T" lectures, time is more efficiently spent on material aligned with the learning objectives in contrast with PowerPoint Presentations which often contain additional material not linked to the learning objectives and may negatively impact student learning, as evidenced by the cognitive load theory. Moreover, as most of our students had been taught during their school days by C&T, they are more familiar, more acquainted and more used to it. 62% strongly agreed that 'C & T' is cheap and does not affect the country's economy very much, while 54% opined for 'C & T' because of its effectiveness in terms of students' engagement and involvement. This result is consistence with the findings of Walielign (2013), who observed that ineffectiveness seen in PPP method could be as a result of reduced students' interactions, Hynka & Mason (1998). Rim & Dorine (2012), observed that students felt more involved and enjoyed greater level of interaction in classes taught with 'C & T' Method. 52% of the students strongly agreed 'C & T' is more flexible and spontaneous.

Students (20%) in both groups had very weak agreements and disagreements on the five parameters of a Lecture and these are methods brings content and Lecturer closer to the students, creates a good rapport between the lecturer and the students, facilitates decision making and problem solving in students and can be used on a very large scale.

5.3 RESEARCH EDUCATION IMPLICATION CONCLUSIONS AND RECOMMENDATIONS.

5.3.1. Education Implication

Based on the results of this study, some educational implications can be drawn.

- When presenting content in the real classroom, the use of visual text enhances learners' visual attention which is a vital element in the acquisition of knowledge, competencies, skills and values.
- To reduce cognitive load in learners, PPP slides should avoid extraneous materials. Extraneous materials reduces conceptual understanding.

5.3.2. Research Conclusions

This study identified the need to shift from traditional talk-and-chalk method of teaching to Simple PowerPoint presentation based on its benefits to students. It was observed that students exposed to Simple PowerPoint presentation (SPPT) performed better than their counterparts taught with chalkboard method. The innovative technology of using Simple PPP seemed to be effective in teaching Science Education.

5.3.3. Research Recommendations

In this space age, tutors in Zambian Colleges and schools are expected to be in the vanguard to propel the use of various ICT tools in promoting effective teaching and learning. Therefore, it is recommended that the use of Simple PPP should be encouraged in Zambian schools and colleges especially for teaching science oriented courses.

- Government and other education stakeholders should provide (PPT) to schools and colleges with adequate infrastructure and training of lecturers and teachers on its usage.

- Lecturers should be encouraged to use PowerPoint presentation in teaching science education and other courses.

.

REFERENCES

Abd-El-Aziz, A. A. **(2014). Effect of PowerPoint presentation on students' psychomotor achievement and retention in auto-mechanics trade in Oyo state technical colleges** JOSTMED, 10(2), 127-137.

Adegoke, B. A. **(2011).Effect of multimedia instruction on senior secondary school students' achievement in Physics.** European Journal of Educational Studies, 3(3), 537-541.

Aliyu, Y. **(2003). Effects of electronic presentation of lectures on student performance.** Abuja: Unpublished Manuscript. University of Abuja.

Alley, M., & Neeley, K. **(2005). Discovering the power of PowerPoint**: Rethinking the design

Aluko, K. O. **(2004). Effects of cooperative and individualistic instructional strategies on students' problem solving strategies on students' problem solving abilities in secondary school chemistry in Ilesa,** Nigeria. (Unpublished Ph.D. thesis, University of Ilorin Nigeria).

Antherson, J. S. **(2003). Learning and teaching: Intelligent.** Retrieved from http://www.dmu. Ac. UK/ Jamie/learning intelligence.htm.

Apperson, J. M., Laws, E. L., & Scepansky, J. A. **(2006). The impact of presentation graphics on students 'experience in the classroom.** Computers & Education, 47, 116–126.

Apperson, J. M., Laws, E. L., & Scepansky, J.A. **(2008). An assessment of student Preferences for PowerPoint presentation structure in undergraduate courses.** *Computers & Education*, *50*(2008), 148–153.

Arigbabu, A. A., & Mji, A. **(2004). Is gender a factor in mathematics performance among Nigerian pre-service teachers?** Sex Role, 51(11 & 12), 749.

Asogwa, U. D. **(2011). Effect of PowerPoint presentations on secondary school student's achievement in Christian religious knowledge.** International Journal of Education Research, 11(1).

Atkinson, C. & Mayer, R. E. **(2004). Five ways to reduce PowerPoint overload.** From http://www.sociablemedia.com/PDF/atkinson_mayer_powerpoint_4_23_04.pdf.

Babb and C. Ross **(2009). "The timing of online lecture slide availability and its effect on attendance, participation, and exam performance,"** Comput. Educ., vol. 52, pp. 868–881. Teach., vol. 19, pp. 175-179, January 1997.

Bartsch RA, Coburn KM. **(2003). Effectiveness of PowerPoint presentations in lectures**. Computer Educ., 41(1): 77-86.

Beets, S. D., & Lobingier, P. G. **(2001). Pedagogical techniques: Student performance and preferences.** Journal of Education for Business, 76, 231–235.

Brown G and Atkins M. **(1988). Effective teaching in higher education. 1st edition,** London, UK: Methuen and Co. Ltd.

Cassady, J. C. **(1998). Student and instructor perceptions of the efficacy of computer-aided lectures in undergraduate university courses.** *Journal of Educational Computing Research*, 19, 175 –189.

ChanLin, L.-J. **(2000). Attributes of animation for learning scientific knowledge.** *Journal of Instructional Psychology, 27*, 228 –238.

Clark, R. C., & Mayer, R. E. **(2008). *E-learning and the science of instruction, 2nd edition.* Pfeiffer:** San Francisco, CA.

Craig, R. J., & Amernic, J. H. **(2006). PowerPoint presentation and the dynamics of teaching.** Innovative Higher Education, 31, 147-160.

Creed, T. **(1997). PowerPoint, no! Cyberspace, yes! The National Teaching and Learning Forum, 6.** Retrieved from http://www.ntlf.com/temp/backup/powerpoint.htm

Daniels, L. **(1999). Introducing technology in the classroom: PowerPoint as a first step.** Journal of Computing in Higher Education, 10(2), 42-56.

David, K. D., & Stanley, H. L. **(2000). Effect of gender on computer-based chemistry problem-solving.** Electronic Journal of Science Education, 4(4).

Din, Y. Y., Ming, M. C., & Esther, S. H. **(2004). Hong Kong student's achievement in OECD-PISA Study: Gender differences in Science content, literary skills, and test item formats.** International Journal of Science and Mathematics Education, 2(1), 91-106.

Driessnack, M. **(2005). A closer look at PowerPoint Feature Article.** *Journal of Nursing Education*, *44* (8), 347.

El-Ikhan, K. K. **(2010). The advantages and disadvantages of teaching with PowerPoint.** Retrieved from http://www.penalido.wordpress.com/theadvantages

Erdemir, N. **(2009). Determining students' attitude towards physics through problem-solving strategy.** *Asia-Pacific Forum on Science Learning and Teaching, 10*(2), Article 1.

Estes A, Ressler S, Welch R, Hanus J. **(2009). Seminar on communication skills.** Exceed teaching workshop, Available from: http://www.asce.org/files/ppt/exceed/USMA-09Seminar-VIChalkboard.ppt.

Fajola, O. O. **(2000). Effect of three modes of computer based instructional strategies on students learning outcomes in biology.** (Unpublished Ph.D. thesis, Department of Teachers' Education, University of Ibadan).

Gallo, C. **(2009). Why PowerPoint isn't enough. Business Week Online**. Retrieved from http://www.businessweek.com/smallbiz/content/oct2009/sb20091020_228161.htm

Gambari, A. I. **(2010). Effects of computer supported cooperative learning strategy on performance of senior secondary students in physics in Minna, Nigeria**. Unpublished Ph.D. thesis, University of Ilorin.

Gambari, A. I., & Olumorin, C. O. **(2013). Effectiveness of video-based cooperative learning strategy on high, medium and low academic achievers.** The African Symposium: An Online Journal of the African Educational Research Network, 13(2), 77-85.

Gier, V. S., & Kreiner, D. S. **(2009). Incorporating active learning with PowerPoint-based lectures using content based questions.** Teaching Psychology, 36(2), 134-139.

Gonen, S. & Basaran, B. (2008). **The new method of problem solving in physics education by using scorm-compliant content package,** *Turkish Online Journal of Distance EducationTOJDE, 9*(3), 112-120.

Hake, R. **(1998). Interactive engagement versus traditional methods:** A six-thousand-student survey of mechanics test data for introductory physics courses. American Journal of Physics, 66 (1), 64-74.

Harp, S. F., & Mayer, R. E. **(1998). How seductive details do their damage: A theory of cognitive interest in science learning.** *Journal of Educational Psychology*, *90*, 414–434

Hastings N. **(2000).Using IT in the undergraduate classroom: should we replace the blackboard with PowerPoint?** Comp Educ.

Howell, D. D. **(2008). "Four key keys to powerful presentations in PowerPoint: take your presentations to the next level," Tech.** Trends, vol. 52, pp. 44-46, November/December 2008.

Hunt N. **(1998). Enhancing lectures the modern way.** The New Academic Autumn, 3-9. Ige, Levasseur, D. G., & Sawyer, J. K. **(2006). Pedagogy meets PowerPoint: A research review of the effects of computer-generated slides in the classroom.** The Review of Communication, 6(1-2), 101-123.

Lowry, R. B. (**1999). Electronic presentation of lectures: Effect upon student performance.** University Chemistry Education, 3, 18 - 21.

Mantei, E. J. **(2000). Using internet class notes and PowerPoint in the physical geology lecture.** *Journal of College Science Teaching, 29,* 301-305.

Mayer, R. E. **(1999). Multimedia aids to problem-solving transfer.** *International Journal of Educational Research, 31*(7), 611–623.

Mayer, R. E. **(2001). Multimedia learning.** New York: Cambridge University Press.

Moreno, R. & Mayer, R.E. **(2000). A coherence effect in multimedia learning:** the case for minimizing irrelevant sounds in the design of multimedia instructional messages. *Journal of Educational Psychology, 92*, 117-125.

Nouri, H., & Shahid, A. **(2005). The effect of PowerPoint presentations on student learning and attitudes.** Global Perspectives on Accounting Education, 2, 53-73.

Ogunkola, J. B., & Bilesanmi-Awoderu, A. O. **(2000). Effects of laboratory and lecture methods on students' achievement in biology.** African Journal of Education, 5(2), 247-260. Okoro, O. M. (**2002). Measurement and evaluation in education.** Obosi: Pacific publishers.

Oludipe, D. I. **(2012). Gender difference in Nigeria junior secondary students' academic achievement in Basic Science.** Journal of Educational and Social Research, 2.

O. S. **(2004). Effect of cooperative learning strategy on senior secondary school chemistry students' performance in solving electrolysis problems in Ilorin, Nigeria.** (Unpublished M.Ed. thesis, CSET department, University of Ilorin, Nigeria).

Rokade SA, Sant SM, Vaidya SA, Mane AK. **(2008). Developing an evaluation system for undergraduate teaching.** Southeast Asian Journal of Medical Education, 2(2): 9-13. Sammons MC. **(1997).Using PowerPoint presentations I writing classes**. North Carolina, Available from http://technologysource.org/article/using_powerpoint_presentations_in_writing_classes.

Savoy, A., Proctor, R. W., & Salvendy, G. **(2009). Information retention from PowerPoint and traditional lectures.** Computers & Education, 52, 858-867.

Seth V, Upadhyaya P, Ahmad M. **(2010a). PowerPoint or chalk and talk: Perceptions of medical students versus dental students in a medical college in India**. Advances in Medical Education and Practice, 1:11 – 16.

Seth V, Upadhyaya P, Ahmad M, Kumar V. **(2010b). Impact of various lecture delivery methods in pharmacology.** Excli Journal, 9: 96-101.

Seth V, Upadhyaya P, Ahmad M, Kumar V. **(2010c). An assessment of teachers' preference for lecture delivery methods in medical education.** Educational Research and Review, 5 (9):533-537.

Shallcross DE, Harrison TG. **(2007). Lectures: electronic presentations versus chalk and talk – a chemist's view.** ChemEduc Res Pract. 8 (1): 73-79.

Stein, K. **(2006).The dos and don'ts of PowerPoint presentations.** *Journal of the American Dietetic Association, 106*(11), 1745 –1748.

Stephenson, J. E, Brown C and Griffin, D. K. **(2008). "Electronic delivery of lectures in the university environment: An empirical comparison of three delivery styles,"** Comput. Educ., vol. 50, pp. 640–651, April 2008.

Sungur, S., & Tekkaya, C. **(2003). Students' achievement in human circulatory system unit: The effect of reasoning ability and gender.** Journal of Science Education and Teaching, 12(1), 59-64.

Susskind JE. **(2000). PowerPoint's power in the classroom: enhancing students' self-efficacy and attitudes.** Comp Educ., 35(3):175-187.

Susskind, J. (**2005). PowerPoint's power in the classroom: Enhancing students' self-efficacy and attitudes.** Computers & Education, 45, 203 - 215.

Szabo, A., & Hastings, N. **(2000). Using IT in the undergraduate classroom: Should we replace the blackboard with PowerPoint?** Computers & Education, 35, 175–187.

Szabo A, Thomas M, Appala Raju B. **(2007). Are PowerPoint presentations fulfilling its purpose?** Southeast Asian Journal of Medical Education, 1(1):3841

Tang T. L. P and Austin, M. J. **(2009). "Students' perceptions of teaching technologies, application of technologies, and academic performance,"** Comput. Educ., vol. 53, pp. 1241-1255, December 2009.

Tufte, E. **(2003). The cognitive style of PowerPoint.** www.edwardtufte.com/tufte/PowerPoint Retrieved 06.07.2010.

Tufte, E. R. **(2003). PowerPoint is evil.** http://www.wired.com/wired/archive/11.09/ppt2.html

Tufte, E. R. **(2006). The cognitive style of PowerPoint: Pitching out corrupts within (2nd Ed.).** Cheshire, CT: Graphics.

Uz, Ç. Orhan, F., & Bilgiç, G. **(2010). Prospective teachers' opinions on the value of PowerPoint presentations in lecturing.** Procedia- Social and Behavioural Sciences, 2, 2051-2059.

Yusuf, A. **(2004). Effects of cooperative and competitive instructional strategies on junior secondary school student's performance in social studies, in Ilorin, Nigeria**. Unpublished Ph.D. thesis, Curriculum Studies and Educational Technology, University of Ilorin, Nigeria.

Yusuf, M. O., & Afolabi, A. O. **(2010). Effects of computer assisted instruction (CAI) on secondary school students' performance in biology.** The Turkish Online Journal of Educational Technology, 9(1).

APPEDICES

APPENDIX I.

ATTITUDE SCALE CHART FOR STUDENTS IN SCIENCE.

Section 1.

Personal Details.
✓ ***(TICK) WHERE APPLICABLE.***

1. Title; (Mr) …….. (Mrs) …… (Ms) ……
2. What is your gender?

   Female……..Male ……..

3. Tick your age range?
   17-20 years…….. 21-24years…… 25-28 years…… Above 29 ……

Section 2.

Background information.

1. Name of Province.
   ……
   ……
2. Name of district.
   ……
   ……
3. Name of institution.
   ……
   ……
4. Institution type.
   Private…… Government…… Grant aided……
5. Number of lecturers by gender in the Science Department.
   Male ……..
   Female ……

Section 3.

Opinions on different parameters that make a good lecture.
ALL UNDER-HERE THEMES ARE BASED ON THE USE OFPOWERPOINT PRESENTATIONS:

Instruction.

Mark an **(X)** where appropriate to agree or disagree on the following ***Parameters/Themes*** of a good lecture based on **PowerPoint Presentation**, **5** will represent (**I strongly agree**) while **1** will represent (**I strongly disagree**).

1	Promotes students' Motivation and Attendance.		1 2 3 4 5
2	Brings content and Lecturer closer to the students.		1 2 3 4 5
3	The method covers a big volume of content and clarity of illustrations is excellent.		1 2 3 4 5
4	It has a good organization of tasks.		1 2 3 4 5
5	The method creates a conducive learning atmosphere.		1 2 3 4 5
6	There is good introduction of the topic.		1 2 3 4 5
7	Students' engagement and involvement is very good in PowerPoint Presentations.		1 2 3 4 5
8	It creates a good rapport between the Lecturer and the Students.		1 2 3 4 5
9	Facilitate decision making and problem solving.		1 2 3 4 5
10	Can be used on a very large scale i.e. with very big classes.		1 2 3 4 5
11	It elevates content/ material over format		1 2 3 4 5
12	Originality of ideas is well presented in PowerPoint Presentation.		1 2 3 4 5
13	The method does not affect the country's economy very much.		1 2 3 4 5
14	The method is flexibility and spontaneous.		1 2 3 4 5
15	It enhances critical thinking, creativity and innovations in students.		1 2 3 4 5

Thank you for your opinions.

APPENDIX II.

ATTITUDE SCALE CHART FOR LECTURERS IN SCIENCE.

Section 1.

Personal Details.

- ✓ ***(TICK) WHERE APPLICABLE.***

4. Title; (Mr) …….. (Mrs) …… (Ms) …… (Dr.) …….. (Prof) …….

5. What is your gender?

Female…… Male …….

6. Tick your age range?

25-30 years…… 31-36 years …… 37-42 years….43-48 years……over 49 years ……

7. Marital status

a) Single ……..
b) Married ……..
c) Widowed ……..
d) Divorced ……..

8. Academic qualification

a) Form iii …….
b) Grade 12 …….
c) Grade 12/GCE ……

9. Professional qualifications

a) None ……
b) Certificate ……
c) Diploma ……
d) Advanced diploma ……..
e) First Degree ……
f) Masters ……
g) Ph.D. ……

10. How long have you been lecturing?

O-5 years …….. 6-10 years …….. 11-15 years ……. 16-20 years ……. Above 20 years ……..

11. Which component of science are you trained to lecture in?

a) Agricultural science ……..
b) Biology …….
c) Chemistry …….
d) Physics ……..

Section 2.

Background information.

6. Name of Province.
……
……

7. Name of district.
……
……

8. Name of institution.
……
……

9. Institution type.
Private…… Government…… Grant aided……

10. Number of lecturers by gender in the Science Department.
Male ……..
Female ……

Section 3.

Opinions on different parameters that make a good lecture:
ALL UNDER-HERE THEMES ARE BASED ON THE USE OFPOWERPOINT PRESENTATIONS:

Instruction.

Mark an **(X)** where appropriate to agree or disagree on the following ***Parameters/Themes*** of a good lecture based on **PowerPoint Presentation**, **5** will represent (**I strongly agree**) while **1** will represent (**I strongly disagree**).

1	Promotes students' Motivation and Attendance.		1 2 3 4 5
2	Brings content and Lecturer closer to the students.		1 2 3 4 5
3	The method covers a big volume of content and clarity of illustrations is excellent.		1 2 3 4 5
4	It has a good organization of tasks.		1 2 3 4 5
5	The method creates a conducive learning atmosphere.		1 2 3 4 5
6	There is good introduction of the topic.		1 2 3 4 5
7	Students' engagement and involvement is very good in PowerPoint Presentations.		1 2 3 4 5
8	It creates a good rapport between the Lecturer and the Students.		1 2 3 4 5
9	Facilitate decision making and problem solving.		1 2 3 4 5
10	Can be used on a very large scale i.e. with very big classes.		1 2 3 4 5

11	It elevates content/ material over format		1 2 3 4 5
12	Originality of ideas is well presented in PowerPoint Presentation.		1 2 3 4 5
13	The method does not affect the country's economy very much.		1 2 3 4 5
14	The method is flexibility and spontaneous.		1 2 3 4 5
15	It enhances critical thinking, creativity and innovations in students.		1 2 3 4 5

Thank you for your opinions.

APPENDIX III.

ATTITUDE SCALE CHART FOR COLLEGE ADMINISTRATORS.

Section 1.

Personal Details.

- ✓ ***(TICK) WHERE APPLICABLE.***

12. Title; (Mr) …….. (Mrs) …… (Ms) …… (Dr.) …….. (Prof) …….

13. What is your gender?

Female…… Male …….

14. Tick your age range?

25-30 years…… 31-36 years …… 37-42 years….43-48 years……over 49 years ……

15. Marital status

e) Single ……..
f) Married ……..
g) Widowed ……..
h) Divorced ……..

16. Academic qualification

d) Form iii …….
e) Grade 12 …….
f) Grade 12/GCE ……

17. Professional qualifications

h) None ……
i) Certificate ……
j) Diploma ……
k) Advanced diploma ……..
l) First Degree ……
m) Masters ……
n) Ph.D. ……

18. How long have you been lecturing?

O-5 years …….. 6-10 years …….. 11-15 years ……. 16-20 years ……. Above 20 years ……..

19. Which component of science are you trained to lecture in?

e) Agricultural science ……..
f) Biology …….
g) Chemistry …….
h) Physics ……..

Section 2.

Background information.

11. Name of Province.

……
……

12. Name of district.

……
……

13. Name of institution.

……
……

14. Institution type.

Private…… Government…… Grant aided……

15. Number of lecturers by gender in the Science Department.

Male ……..

Female ……

Section 3.

Opinions on different parameters that make a good lecture:
ALL UNDER-HERE THEMES ARE BASED ON THE USE OFPOWERPOINT PRESENTATIONS:

Instruction.

Mark an **(X)** where appropriate to agree or disagree on the following ***Parameters/Themes*** of a good lecture based on **PowerPoint Presentation**, **5** will represent (**I strongly agree**) while **1** will represent (**I strongly disagree**).

1	Promotes students' Motivation and Attendance.		1 2 3 4 5
2	Brings content and Lecturer closer to the students.		1 2 3 4 5
3	The method covers a big volume of content and clarity of illustrations is excellent.		1 2 3 4 5
4	It has a good organization of tasks.		1 2 3 4 5
5	The method creates a conducive learning atmosphere.		1 2 3 4 5
6	There is good introduction of the topic.		1 2 3 4 5
7	Students' engagement and involvement is very good in PowerPoint Presentations.		1 2 3 4 5
8	It creates a good rapport between the Lecturer and the Students.		1 2 3 4 5
9	Facilitate decision making and problem solving.		1 2 3 4 5
10	Can be used on a very large scale i.e. with very big classes.		1 2 3 4 5
11	It elevates content/ material over format		1 2 3 4 5

12	Originality of ideas is well presented in PowerPoint Presentation.		1 2 3 4 5
13	The method does not affect the country's economy very much.		1 2 3 4 5
14	The method is flexibility and spontaneous.		1 2 3 4 5
15	It enhances critical thinking, creativity and innovations in students.		1 2 3 4 5

Give some brief points about your opinions on the use of Simple PPP in lecturing students in terms of:-

- Students general performance
  ……
  ……
- Lecturers preparations
  ……
  ……
- College reputation.
  ……
  ……

<u>Thank you for your opinions.</u>

APPENDIX IV.

SEAT. (Science Education Achievement Test) – Pre-test.

PRE-TEST PAPER.

GRADE NINE INTERGRATED SCIENCE WORK:

CLASS: _____ ***SEX*** | M | F |

INSTRUCTIONS. Circle the correct answer out of the given alternatives.

1. What name is given to any substance that has mass and occupies space? **(A**)Weight **(B)** Volume **(C)** State **(D**) Matter.
2. Sodium Chloride, Ammonium Chloride, Naphthalene and Iodine crystals all undergo the process of …… when heated. **(A**) Evaporation. **(B)**Melting **(C)** Sublimation. **(D**)Solidification.
3. The reaction between Calcium Metal and cold water is **vigorous**. What do you understand by the term **vigorous (A**)Moderate **(B)** Very slow**(C)** Very fast **(D**)Slow
4. Water and Ethanol mixes thoroughly. This kind of mixture is said to be ……. **(A**)Homogeneous **(B)** Monogeneses **(C)** Heterogeneous **(D**) polygenesis.
5. ……. is the fusion of the Male sex cells and the Female sex cells in order to form a zygote in mammals. **(A**)Fertilisation **(B)**Reproduction **(C)**Ejaculation **(D**)Sex
6. Which of the following is **NOT** a sign of puberty stage in girls **(A**) Menstruation **(B)** Deepening of the voice **(C)** Broadening of hips **(D**) development of mammalian glands.
7. All the listed electric appliances, apart from one, make use of a bimetallic strip, which is the ODD one out? **(A**) An electric iron **(B)**Road flash lights **(C)**Energy saving bulb **(D**)
8. The process by which heat is transferred through liquids and gases is called? **(A**)Radiation **(B)**Conduction **(C)**Convection and radiation **(D**)Convection
9. The element in plants which is responsible for the formation of chlorophyll is …….. **(A**)Magnesium **(B)**Nitrogen **(C)**Potassium **(D**)Phosphorous
10. The name of the scientist who discovered the Earth is spherical is ……..... (A) Bohr **(B)**Galileo **(C)**Eureka **(D**)Newton

11. ……..is the process whereby sperms are collected from desirable male animals to be injected in a desirable female in order to impregnate it is called? **(A**)Cross breeding **(B)**Artificial insemination **(C)** Fertilisation **(D**) Selective breeding

12. Rainbows are formed when light from the sun passes through the water drops. Mention two process that take place in rain bow formation. **(A**)Reflection and dispersion of light **(B)** Refraction and reflection **(C)** Incidence and refraction **(D**) Refraction and dispersion of light.

13. Photosynthesis is the process by which plants make their own food. This process mainly takes place in the ……..layer of a leaf **(A**)Spongy **(B)**palisade **(C)**Mesophyll **(D**)stomata

14. **I**-2/2 **C**-1/1 **P**-3/3 M-2/2 is the dental formula for a …… **(A**)Impala **(B)**Dog **(C)**Goat **(D**)Man

15. ……. Is the kind of feeding practised by Elephants, Giraffe and Rhinos is referred to as: **(A**)Sucking **(B)**Browsing **(C)**Munching **(D**)Grazing

16. Most animals in Zambia are facing **extinction.** The word extinction means **(A**)Increasing in number **(B)**Reducing in number **(C)**No longer exist **(D**) Changing colour

17. An animal which is chased by another animal for food is called? **(A**)prey **(B)**Predator **(C)**Carnivore **(D**) Herbivore

18. In electricity voltage and current are directly proportional to each other. Which law confirms this statement.**(A**)Ohms law **(B)**Law of electricity **(C)**Law of floatation **(D**)Law of magnetism

19. ……is the only metal on the periodic table in liquid form.**(A**)Mercury **(B)**Iodine **(C)**Bromine **(D**)Diamond

20. Apart from planet Earth, the other planet with the possibility of remote life is ……**(A**)Mars **(B)**Venus **(C)**Jupiter **(D**)Uranus

21. Water is an example of a ……. Resource **(A**)Renewable **(B)**Waste asset **(C)**Mineral resource **(D**)Non renewable

22. In a four stroke combustion engine, the stroke in which both valves are closed and the piston moves downwards is called? **(A**)Power **(B)**Compression **(C)**Exhaust**(D**)Inlet

23. Which of the following is **NOT** a deficient disease. **(A**)Goitre **(B)**Malaria **(C)**Rickets **(D**)Marasmus

24. What conclusion can you make if you find the density of 2 substances the same.**(A**)They have the same shape **(B)**They have the same mass **(C)** They have the same material **(D**) They have the same volume

25. The number of people living per square kilometres is called? **(A**)Population habitat **(B)**Population growth **(C)**Population density **(D**)Population demography

Thank you for taking part in this research.

God bless you.

APPENDIX V.

SEAT. (Science Education Achievement Test) – Post-test.

POST-TEST PAPER.

<u>BASED ON THE FOLLOWING TOPICS-</u> HUMAN BODY, PLANTS AND THE ENVIRONMENT:

CLASS: _____ SEX

M	F

INSTRUCTIONS. Circle the correct answer out of the given alternatives.

1. ……. is the fusion of the Male sex cells and the Female sex cells in order to form a zygote in mammals. **(A**)Fertilisation **(B)**Reproduction **(C)**Ejaculation **(D**)Sex
2. Which of the following is **NOT** a sign of puberty stage in girls **(A**) Menstruation **(B)** Deepening of the voice **(C)** Broadening of hips **(D**) development of mammalian glands.
3. Which teaching method do you think is best for teaching the topic 'where do babies come from'?**(A**)Discussion **(B)**Field trip **(C)**Experimentation **(D**)Demonstration
4. Which of the following is **NOT** a sexually transmitted disease. **(A**)HIV/AIDS **(B)**Gonorea **(C)**Whooping cough **(D**)Syphilis
5. During sexual intercourse, the part in female reproductive organs that produces a mucus-like fluid to reduce friction is called? **(A**)Uterus **(B)**Vulva **(C)**Cervix **(D**)Vagina
6. The part that is responsible for the production of the male sex cells is called? **(A**)Testes **(B)**Scrotum **(C)**Penis **(D**)Sperm duct
7. Most boys and girls reach their puberty between ….and….years. **(A**) 13, 19 **(B)** 8. 12 **(C)**21, 35 **(D**) 18, 21
8. Which of the following is **NOT** a deficient disease. **(A**)Goitre **(B)**Malaria **(C)**Rickets **(D**)Marasmus
9. The process by which manufactured food in plants is transported from the leaves to all parts of the plant is called? **(A**)Transpiration **(B)**Translocation **(C)**Active transport **(D**) Respiration

10. The …… cells are responsible for controlling the amount of light and carbon dioxide entering the leaf. **(A**)Xylem **(B)**Guard **(C)**Phloem **(D**)Stomata

11. When you come across a plant with yellowish leaves and a lot of black sport. Which major mineral could this plant be lacking? **(A**)Iron **(B)**Phosphorous **(C)**Nitrogen **(D**)Potassium

12. What material is used to determine the water content in the leaf?**(A**)Iodine solution **(B)**Cobalt chloride paper **(C)** Aluminium foil **(D**)Benedict solution

13. Which food below is a good source of polysaccharides?**(A**)Cassava **(B)**Oranges **(C)**Sweet potatoes **(D**) Bananas

14. The cells through which water and mineral salts pass from the roots to the leaves are called?**(A**)Phloem **(B)**Bundles **(C)**Stem **(D**)Xylem vessels

15. The element in plants which is responsible for the formation of chlorophyll is …….. **(A**)Magnesium **(B)**Nitrogen **(C)**Potassium **(D**)Phosphorous

16. Photosynthesis is the process by which plants make their own food. This process mainly takes place in the ……..layer of a leaf **(A**)Spongy **(B)**palisade **(C)**Mesophyll **(D**)stomata

17. Bananas are grown from ……..**(A**)Suckers **(B)**Runners **(C)**stems **(D**)Bulbs

18. Water is an example of a ……. Resource **(A**) Renewable **(B)**Waste asset **(C)**Mineral resource **(D**) Non renewable

19. The number of people living per square kilometres is called? **(A**)Population habitat **(B)**Population growth **(C)**Population density **(D**)Population demography

20. ……..is the process whereby sperms are collected from desirable male animals to be injected in a desirable female in order to impregnate it is called? **(A**)Cross breeding **(B)**Artificial insemination **(C)** Fertilisation **(D**) Selective breeding

21. During a road construction water is spread in order to prevent …….pollution. **(A**)Noise **(B)**Air **(C)**Land **(D**)Water

22. The best place you can take your pupils when teaching water pollution is the …… **(A**)Rubbish pit **(B)**Borehole **(C)**Sewage **(D**) Forest

23. Which of the following chemical is responsible for the formation of acid rains. **(A**)Hydrogen **(B)**Carbon monoxide **(C)**Sulphur dioxide **(D**)Carbon dioxide

24. A pollutant is a substance that contaminates the environment. To contaminate is to…….**(A**)freshening **(B)**Colouring **(C)**Softening **(D**)Dirtying

25. SOIL-CABBAGE-GRASS HOPPER-CHICKEN: This interaction is called?
(A)Primary consumer **(B)**Food web **(C)**Trophic level **(D**)Food chain

Thank you for taking part in this research.

God bless you.

APPENDIX VI.

COVER PAGE.

ZIMBABWE OPEN UNIVERSITY
In collaboration with
THE UNIVERSITY OF ZAMBIA

THE EFFECTS OF POWERPOINT AS OPPOSED TO LECTURE PRESENTATIONS ON CONTENT UNDERSTANDABILITY IN SCIENCE EDUCATION. A CASE OF CHIPATA COLLEGE OF EDUCATION: STUDENTS.

A Dissertation Report

By

Thole Jonathan

Submitted to the Zimbabwe Open University in Partial Fulfilment of the Requirements for the Degree of **Master** of Education

In

Education Management and Administration.

Lusaka, Zambia

2017.

APPENDIX VII.

APPROVAL FORM.

ZIMBABWE OPEN UNIVERSITY
In collaboration with
THE UNIVERSITY OF ZAMBIA

APPROVAL FORM.

The undersigned certify that they have read, and recommend to the Zimbabwe Open University for acceptance of a dissertation entitled "**THE EFFECTS OF POWERPOINT AS OPPOSED TO LECTURE PRESENTATIONS ON CONTENT UNDERSTANDABILITY IN SCIENCE EDUCATION. A CASE OF CHIPATA COLLEGE OF EDUCATION: STUDENTS.**
". Submitted by Thole Jonathan in Partial Fulfilment of the Requirements for the Degree of Master of Education in Education Management and Administration.

……..
……..
SUPERVISOR.

……..
……..
PROGRAMME COORDINATOR

……..
……..
EXTERNAL EXAMINER

DATE: ……/……/……

APPENDIX VIII.

RELEASE FORM.

ZIMBABWE OPEN UNIVERSITY
In collaboration with
THE UNIVERSITY OF ZAMBIA

RELEASE FORM.

NAME OF AUTHOR:	THOLE JONATHAN.
TITLE OF PROJECT:	The effects of PowerPoint as opposed to lecture presentations on content understandability in Science Education. A case of Chipata College of Education: students.
DEGREE FOR WHICH PROJECT WAS PRESENTED:	Master of Education in Education Management and Administration.
YEAR DEGREE WAS GRANTED:	2017.

Permission is hereby granted to the Zimbabwe Open University/ The University of Zambia Library to reproduce single Copies of this Dissertation and lend or sell such copies for private, scholarly or scientific research purpose only.

The author reserves other publication rights and neither the dissertation nor extensive extracts from it may be printed or otherwise reproduced without the author's written permission.

SIGNED:

…… PERMANENT ADDRESS: Changaya Farms, Lundazi.

DATE: NOVEMBER 2017.

APPENDIX IX.

DEDICATION

This dissertation is dedicated to my mother, Margaret kaponda, my wife, Charity Kazovu, my three sons - David Thole, Tabernacle Thole and Elija Thole in remembrance of their support during the period of my study.

APPENDIX X.

ABSTRACT

The purpose of the study was to compare the effects of simple text PowerPoint Presentations and the traditional 'chalk and talk' method through students' scores of an achievement test after a treatment. This paper discusses the importance of an effective instruction delivery mode as evidenced by the decline in performance of newly deployed teachers in Zambian primary schools. Benefits of simple PowerPoint presentation in classroom instruction as a means to improve classroom teaching in Zambian Primary Colleges are also discussed. The effectiveness of PowerPoint Presentation (PPP) and the traditional 'chalk and talk' methods for teaching Science Education concepts were determined using a pre - test-post - test, non-equivalent, non-randomized experimental group design. One hundred twenty 1st year students formed the sample. The two classes were randomly assigned to experimental and control groups. The experimental group was taught some selected concepts from Science Education using PowerPoint Presentation (PPT) while 'Chalk and talk' method was maintained for the control group. A validated Science Education Achievement Test (SEAT) comprising a 25-item multiple-choice test and an opinion Scale Chart containing 15 Themes were employed for data collection.

The hypotheses were tested using SD, z-test and t-test analysis to find the associations between the two teaching modalities and students' understandability of science concepts. Graphical illustration were also used for visual displays.

Results revealed that the students taught with PPP performed better than their counterparts taught with 'Chalk and talk' method. The PPT was found also to be gender friendly.

Based on the findings, it was recommended that the use of PPT should be encouraged in Zambian Primary Colleges.

APPENDIX XI.

ACKNOWLEDGEMENS.

Apart from the major one, GOD, King of kings and lord of lords, this study is the result of the support, goodwill and insight of a number of people, all of whom deserve my sincere thanks. The first round of applause should go to my Research supervisor, Doctor. D. Banda for his positive guidance, advice and encouragements.

My thanks also extends to my fellow Education Managers for their support in pursuing this programme.

Finally, I absolutely must acknowledge the forbearance, love, support and encouragements of my family and friends; my wife in particular.

APPENDIX XII.

LETTER OF PERMISSION FROM INSTITUTION.

THE UNIVERSITY OF ZAMBIA
INSTITUTE OF DISTANCE EDUCATION

Telephone: 26021-1-291777-78 Ext. 3500 0978772249
Telegrams: UNZA LUSAKA
Telex: UNZALU ZA 44370
Fax: 26021-1-290719
Your Ref:
Our Ref:

P.O. Box 32379
LUSAKA, ZAMBIA

13th July, 2017

THE DISTRICT EDUCATION BOARD
SECRETARY.

MoGE.
P.O. BOX 530033

LUNDAZI.

Dear Sir/Madam

RE: CONFIRMATION OF STUDY

Reference is made to the above subject.

This serves as a confirmation that the above mentioned person of NRC No: 455608/52/1 and computer number 715806421 is a bonafide student of the University of Zambia in collaboration with Zimbabwe Open University (UNZA-ZOU).

The student is pursuing a Master of Education in Educational Management and he will be carrying out a research on
THE EFFECTS OF POWERPOINT AND TRADITIONAL LECTURES ON STUDENT CONTENT UNDERSTANDABILITY: A CASE OF CHIPATA COLLEGE OF EDUCATION.
Any assistance rendered to him will be greatly appreciated.

Yours faithfully

Prof. B. Namangala, PhD
DIRECTOR
INSTITUTE OF DISTANCE EDUCATION

THE UNIVERSITY OF ZAMBIA
DIRECTOR
18 JUL 2017
INSTITUTE
OF DISTANCE EDUCATION
P.O. BOX 32379, LUSAKA

APPENDIX XIV.

LETTER OF PERMISSION FROM DEBS/ PEO.

All communications should be addressed
To the District Education Board Secretary
Email: lundazidebs@gmail.com
Tel: 480016
Fax: 480016

In reply please quote
TS/46581
.....

REPUBLIC OF ZAMBIA
MINISTRY OF GENERAL EDUCATION

DISTRICT EDUCATION BOARD SECRETARY
P.O. BOX 530033
LUNDAZI

2nd August, 2017

The Principal
Chipata College of Education
CHIPATA

RE: **INTRODUCTION – MR. JONATHAN THOLE TS/46581**

The subject matter referred.

I write to introduce the above named who is a bonafide employee of the Ministry of General Education and is currently rendering his services at Chiwe Primary School.

Mr. Thole has come to your institution to do his research study.

Kindly receive and assist him accordingly.

B. Ngoma
District Education Standards Officer
For/District Education Board Secretary
LUNDAZI
/bm....