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RESEARCH STUDY DETAILS

THE ROLE OF INSTRUCTIONAL MEDIA IN TERTIARY STUDENTS' CONCEPTUALIZATION OF INTENDED LEARNING OUTCOMES IN BOTSWANA

by

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Supervisor**:** **PROF DR PJ HEERALAL**

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DECLARATION

DECLARATION Student number: **34956018**

I declare that **THE ROLE OF INSTRUCTIONAL MEDIA IN TERTIARY STUDENTS' CONCEPTUALIZATION OF INTENDEND LEARNINGOUTCOMES IN BOTSWANA** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

SIGNATURE
MUROMBO ANOLD GWESHE

15 /12/2015
DATE

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I hereby express my heartfelt appreciation and gratitude to:

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DEDICATION

This work is dedicated to my family, especially my son; Lemuel Dan Anesu Gweshe, who became a blessing to us, when I was forty –five years of age. May the good Lord bless him, and continue to give him wisdom in abundance to remain a blessing to us even in our old ages. The grace of God be upon him until eternity. Amen.

ABSTRACT

Instructional media is expensive yet it may be underutilized. This study explored the perceptions of tertiary educators in Botswana on the role of instructional media in tertiary students' conceptualization of intended learning outcomes. Quantitative research was used to a greater extent and the qualitative to a lesser extent. The study is a survey in which a questionnaire with twenty-two (22) items was used as a data collection instrument. An initial total of 300 copies of the questionnaire were sent to a sample of 30 tertiary institutions in Botswana. A total of 183 questionnaires were returned, thus 61% return rate. A number of findings emanated from this study, and it was concluded that instructional media enhances tertiary students' conceptualization of intended learning outcomes. There was a correlation between instructional media utilization and students' conceptualization of intended learning outcomes. Respondents also reported that instructional media aroused interest in learning and enhanced effective teaching and learning during the teaching and learning process; and that instructional media improved learning, thereby improving academic achievement of the learners, up to estimated 50% or better than students who were taught using the traditional ways. It was also found out that computers and their accessories were frequently used as well as a combination of instructional media. Another finding was that the same media were frequently used because of lack of resources and that they were the only instructional media available in the institutions. The study further concluded that, the amount used to purchase and maintain instructional media at departmental, faculty and or institutional level was seen to be put to good use. The study recommends that: instructional media be one of the main components of teaching and learning process in tertiary institution; a policy to be formulated on financing; use and management of instructional media; training of tertiary educators on different types of instructional media to be made a priority; otherwise purchased instructional media may end up as white elephants in schools.

KEY TERMS

Instructional media

Tertiary students

Conceptualization

Intended learning

Outcomes

Tertiary educators

Weak media effect

Strong media effect

LIST OF ABBREVIATIONS AND ACRONYMS

TEC	Tertiary Education Council
BOTA	Botswana Training Authority
BQA	Botswana Qualification Authority
HRDC	Human Resources Development Council
CAI	Computer Assisted Instruction
ISTE	International Society for Technology in Education
eMINTS	enhancing Missouri to Learn network Teaching Strategies
IIM	Improvised Instructional Material
AAG	Average Ability Group
LAG	Low Ability Group
IWB	Interactive White Board
TIMSS	Trends in International Mathematics and Science Study
OECD	Organization for Economic Cooperation and development
TAAS	Texas Assessment of Academic Skills
SIIA	Software and Information Industry Association
SIM	Standard Instructional Materials
ANCOVA	Analysis of Covariance
PC	Personal Computers
ERTA	Examinations Research and Testing Division
Sa	Sine anno (without a year)
SI	Sine loco (without a place)
Sn	Sine nominee (without a name)
{SI: sn}	Without a place of publishing and no publisher
ABCD	Audience, Behavior Condition and Degree
SMART	Specific Measureable Achievable Realistic and Timespan
ASSURE	Analyses Learner, State Object Select Instructional Methods, Media and Materials, Require Learners Participation and Evaluate and revise
ROI	Rate on Investment

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TITLE

THE ROLE OF INSTRUCTIONAL MEDIA IN TERTIARY STUDENTS' CONCEPTUALISATION OF INTENDED LEARNING OUTCOMES IN BOTSWANA

CHAPTER ONE

INTRODUCTION TO RESEARCH

1.0 introduction

Education plays a crucial role in our society. It forms the foundation, the cornerstone and the bedrock of every facet of development. Education is now a human right rather than a privilege. Therefore, from time to time, education needs researches to be carried out in order to evaluate its effectiveness and to discover areas that need development and change. In this chapter the background to the research topic: **The role of instructional media in tertiary students' conceptualization of intended learning outcomes in Botswana** was explored. This chapter also looked at the statement of the problem, research question, aims and objectives of the study, motivation and benefits of the study, definition of terms, research methodology, population and sampling procedure and data collection instrument and procedures.

1.1 Background of study

Instructional media has been an integral part of teaching and learning. The assumption has been that student's academic achievement or performance largely depends on instructional media usage during the teaching and learning process. The effectiveness of instructional media has been debated and researched from the time of Clark /Kozma debate on the effectiveness of instructional media in the teaching and learning process (Marx 2006).These researchers have not come to a conclusive agreement about the effectiveness of instructional media; rather they have produced two emerging schools of thought based on the research findings, that is: The strong media effect and the weak media effect. The debate still goes on, because the results of the research have confirmed both the strong media effect and the weak media effect; the strong media effect school of thought argue that instructional media enhances conceptualization of intended learning outcomes, whereas the weak media effect on the other hand argues that instructional media do not enhance conceptualization of intended learning out

Comes, but just convey the information to the learner without any effect on the learner's academic achievement.

It is therefore imperative to find out the role of instructional media in the teaching and learning process at tertiary level of education, taking cognizance of theories of learning- the cognitive theory of learning represented by cognitivists such as Bruner, Piaget, Dale, Vygotsky and others(Lutz and Huitt 2004).The cognitivists have shown that at certain stages of mental development of a learner, the learner is capable of learning abstract concepts, even without the use of instructional media. If so, then why is the debate about the effectiveness of media still continuing? The cognitive theory of learning has shown that learners develop from low order to high order cognition. This means that, it is at high order cognition where there is abstract conceptualization of intended learning outcomes, for instance at formal operational stage according to Jean Piaget, at the symbolic mode according to Jerome Bruner, and at the visual and verbal symbols according to Edgar Dale. Although Dale was working from an instructional media perspective, we can still say that at a certain level of mental development instruction can be given verbally without the learner associating what is being learnt with any instructional media. The above stages of mental development imply that learners are able to conceptualize abstractly the intended learning outcomes without necessarily using instructional media, in the teaching and learning process. The abovementioned stages (formal operational/symbolic) of mental development are associated with students who are at tertiary level of education where they are expected to be at formal operational (Piaget) and symbolic (Bruner) stages of mental development, where abstract concepts can be understood without the use of instructional media. Bloom's taxonomy of educational objectives in the cognitive domain, also categorized educational objectives, starting from the simplest behavior to the most complex, showing degrees of difficulties as one moves from concrete learning to abstract learning.

Instructional media is cited as one of the factors that significantly influences educational costs, apart from salaries and other running costs .Careful consideration has to be taken into account at tertiary level of education, when Governments devote financial

resources to purchase materials and equipment to be used as instructional media in the teaching and learning process, for example, Software Information Industry Association(SIIA), shows that the U.S. tripled spending for instructional technology to a projected $6.2 billion in 1999-2000(SIIA 2000:2). Yet Psacharopoulos and Patrinos (2002) found that, returns on investment in education are declining and that higher education has less social benefits compared to private benefits that accrue to the individual. In other words investing in higher education has little benefits to the society, when compared to primary and secondary sectors of education (Psacharopoulos 2009). Therefore there should be some form of justification to use these huge financial resources to purchase instructional media, at the tertiary level of education. The concern for financing education and the commensurate results is supported by an observation in the **"Education at Glance"** Organization for Economic Cooperation and Development (OECD (2011:280)

"The relationship between the resources devoted to education and the outcomes achieved has been the focus of much debate in recent years…at the same time, given the increasing pressure on public budgets, there is intense interest in ensuring that funding-public funding, in particular is directed so as to achieve the desired outcomes as efficiently as possible."

Instructional media is one of those resources that contribute significantly to the cost of education, and therefore, this calls for an audit through formal research, to ascertain whether the use of instructional media produces the desired results.

"Education at Glance" (2011:282), also notes that "High spending per student cannot automatically be equated with strong performance by the education systems..." This means that, there seems to be no cause and effect relationship between the amount used during teaching and learning process and the students' academic achievement. Therefore at tertiary level of education, where students are supposed to learn symbolically, can there be a need to spend so much in the form of instructional media, when high spending, at times, does not justify the results of the education System?

1.2 Statement of the problem

The research seeks to find out the role of instructional media in tertiary students' conceptualization of intended learning outcomes at tertiary level of education, or to find out whether instructional media influence academic achievement of learners, because learners at tertiary education are assumed to process information abstractly according to cognitive theory of learning , here represented by Piaget's formal operational stage of cognitive development, and Bruner's symbolic stage, where students are assumed to able to grasp abstract concepts, and are assumed to be able to conceptualize abstract concepts. This study used the lampshade model to come up with the research question, research objectives, the research sub questions and subsequently the items on the questionnaire.

1.3 Research question

According to Hofstee (2006:85), the research questions are used to name as precisely as possible what the study will attempt to find out. In this study, the research question was: **What is the role of instructional media in tertiary students 'conceptualization of intended learning outcomes at tertiary level of education in Botswana?**

1.4 Sub questions

The purpose of the sub questions is to break the research question into manageable units for data collection, in order to answer the research question, and for this study, the following were the sub questions that informed the construction of the questionnaire:

1.4.1 What are the views of tertiary educators concerning the necessity and relevance of using instructional media at tertiary level of education?

1.4.2 What are the perceptions of educators about the extent and frequency of utilizing instructional media at tertiary level of education?

1.4.3 What are the other benefits of using instructional media during the teaching and learning process, other than the currently debated conceptualization effect at tertiary level of education?

1.4.4 What is the relationship between instructional media and students' academic achievement?

1.4.5 To what extent does the students' academic performance justify the financial resources used to purchase instructional media?

1.4.6 What types of instructional media are frequently used at tertiary level of education?

1.5 Aim of the study

The aim of the study was to find out the perceptions of educators on the role, importance and use of instructional media at tertiary level of education in Botswana. The study's broad goal is to remedy existing misconceptions, assumptions and misinformation on the role, importance and use of instructional media in the teaching and learning process in relation to students' conceptualization of intended learning and finally students' academic achievement.

1.6 Objectives of the study

Hofstee (2006:86) explains that naming the research objectives of your work simply means that you write every objective down one by one and then explain each so that your reader understands exactly what you mean.

This study had the following three objectives:

1.6.1To examine and describe, the effectiveness of instructional media in the conceptualization of intended learning outcomes at the tertiary level of education. This objective sought to find out and describe the current practices in instructional media use, and how educators (Lecturers/tutors) view instructional media's effectiveness in tertiary students' conceptualization of intended learning outcomes in Botswana.

1.6.2To justify and verify, if there is a correlation between instructional media and students' academic achievement, at tertiary level of education. This objective

sought to find out if a relationship exists between instructional media and tertiary students' academic achievement, so as to justify and verify the correlation as seen from the educators' point of view.

1.6.3To establish the status of instructional media usage, in the tertiary sector of education. This objective sought to find out whether tertiary institution lectures or tutors use instructional media during teaching and learning; and if so, how often they do; and whether this use is an individual initiative or an institutional requirement.

1.7 Motivation of study

The motivation of this study is to find out, justify and verify the relevance, usage and impact of instructional media on tertiary students' conceptualization of intended learning outcomes, and to clear any misconceptions, locally, nationally and globally about the relationship between instructional media and students' conceptualization of intended learning outcomes and their academic achievement at tertiary level of education. Secondly, the motivation is to lay a theoretical basis in order to facilitate policy formulation regarding instructional media in the teaching and learning process, and to provide recommendations based on research findings on financial implications and students' achievement, in order to either make instructional media a compulsory or an optional requirement in the teaching and learning process at tertiary level of education. This is why Tuckman (1972:295), argues that, "There is also a need in Education for the establishment and verification of theories or models."

1.8 Benefits of study

The study will cast some light on instructional media and their impact on students' academic achievement at tertiary level of education, thereby helping instructors, education supervisors, policy makers, curriculum designers, statutory regulatory bodies, students and other consumers of education to make informed decisions on the current practices of instructional media at the tertiary level of education. This study's findings

will equip educational managers with knowledge to make informed decisions, that impact positively on the quality of education, and the internal and external efficiency of the education system of Botswana.

1.9 Definition of terms

Hofstee (2006:86), argues that definitions of terms are important to allow correct interpretation and understanding of what you mean to the reader, and it does not matter whether the definition is your own or from the dictionary and Ormrod (2010:58), who also argue that, without knowing explicitly what a term means, we cannot evaluate the research or determine whether the researcher has carried out what was proposed in the problem statement. Therefore the following terms are explained as they are used in this study and for the purpose of this study.

1.9.1 Instructional media here refers to anything that transmits information during the teaching and learning process (computers and their accessories, models, projectors, charts, internet, other than the traditional book, teacher, and board (Black, green or white board(s)).

1.9.2 Conceptualization in this study means internalization of the concepts, so as to remember them, when that knowledge is needed for example in examination or everyday life experiences.

1.9.3 Tertiary education here refers to post-secondary education from certificate to post graduate degrees, accredited by Botswana Training Authority (BOTA), now called Botswana Qualification Authority (BQA) and Tertiary Education Council (TEC), now called Human Resources Development Council (HRDC).

1.9.4 Intended learning outcomes, it is the knowledge or skills, competencies or abilities, that the lecturer expects that the learners should be able to conceptualize and then demonstrate after teaching and learning process has taken place.

1.9.5 Teaching refers to giving of instruction by the lecturer(s) or tutor(s), in a formal teaching tertiary institution(s).

1.9.6 Learning refers to receiving of instruction by tertiary students, in a formal learning institution(s).

1.9.7 Weak media effect means a school of thought which purports to suggest instructional media do not have academic effect on students' conceptualization of intended learning outcomes; as a result no academic achievement can be attributed to instructional media on the part of the learner.

1.9.8 Strong media effect- a school of thought which purports to suggest that instructional media have academic effect on students' conceptualization of intended learning outcomes, thereby improving academic achievement of the learners.

1.10 Research design

This study used the quantitative research design, as Wimmer and Dominick (2003); assert that, quantitative research design requires that the variables under consideration be measured. Leedy and Ormrod (2010:94) explain that; "quantitative research involves looking at amounts, or quantities, of one or more variables of interest." In this study, the responses from the questionnaires are quantified for each sub problem, culminating into to answer statistically the research question.

1.11 Research methodology

This study followed the survey method, which Leedy and Ormrod (2010:187) describe as involving acquiring information about one or more groups of people-perhaps about their characteristic, opinions, attitudes, or previous experiences- by asking them questions and tabulating their answers. Hofstee(2006:122), says, "If you use survey

based design, you are essentially trying to elicit information from a limited number of individuals who are presumed to have the information you are seeking ,who are able and willing to communicate ,and who are (nearly always) intended to be representative of a larger group". The aim of this study is to find out perceptions, usage and relevance of instructional media at tertiary level of education. The survey method is appropriate to this study because by its nature, it is one of the best ways to find the opinions or perceptions of tertiary educators on the impact of instructional media on tertiary students' conceptualization of intended learning out comes in Botswana.

1.12 Units of analysis

In this study, the units of analysis are the responses solicited by the questionnaires.

1.13 Population

The population comprised of all tertiary institutions in Botswana; registered and accredited by either Botswana Qualification Authority (BQA) and or by Human Resources Development Council (HRDC).These are regulatory bodies by Act of Parliament. BQA goes further to accredit Trainers and Assessors of different programs. By 2010, BQA had registered 284 training institutions and HRDC 36 institutions The population is composed of 284 BQA registered and accredited institutions and 36 HRDC registered and accredited institutions, some of which are public, others private, community owned, and yet others parastatals. The reason was to get a fair representation of all tertiary institutions in Botswana. This further helped to include all population parameters and their characteristics.

1.14 Sampling

This study used mainly probability sampling procedures, in order to increase the degree of representativeness and heterogeneity in the sample for generalization purposes.

Heterogeneity in the tertiary education sector, institutions is brought about by the following factors: ownership of institutions, level of program offered for example, certificate, diploma or degree programs; and the types of programs offered. This study then used the systematic stratified techniques. This is supported by Mhlanga and Ncube (2003:58), when they argue that, “It is the highest level of sampling…The systematic sample would consider selecting each nth subject from the population list. This tactic can be infused in to other designs like stratified and cluster designs.” To a lesser extent this study used the non-probability sampling technique when the institution was of its own type.

1.15 Research Instruments

This study used a structured questionnaire, which is explained by Mhlanga and Ncube (2003) as a document consisting of question items that solicit information from a subject that is suitable for research analysis. The questionnaire*(see appendix 2 attached)* for this study had 22 items, seventeen of which are closed ended, meant to get information about the status quo of instructional media and tertiary students ’conceptualization of intended learning outcomes, and these items are structured for statistical purposes. The questionnaire had five open ended questions, meant to elicit information why the respondent chose a particular response, or to provide space for the respondents to make a comment or point of observation and this helped to guard against unconscious selection of responses. It also helped as a form of simple triangulation to get reliable responses.

1.16 Data collection plan

The questionnaire was sent out with a return envelope stamped and already addressed to the researcher. Respondents posted after completion, through the link persons nominated by institutions for easy facilitation of questionnaire returns to the researcher. The questionnaire was sent electronically, to those who indicated access to internet. The researcher visited those institutions that were sampled in the vicinity of the

researcher to administer questionnaires. However, for sampled institutions within Francistown and its environs, the researcher delivered the questionnaire personally.

1.17 Data presentation

The data was presented in, diagrammatically for comparison purposes. The following data is going to be presented: the demographics of the respondents, response rate, response on each sub question, responses from the questionnaire items.

1.18 Data analysis procedure

The data collected was analyzed using frequency, percentages and valid percentages, for closed ended questions. For open ended questions, the reason, suggestions, comments were thematically coded. The SPSS statistical procedures were used to analyze data.

1.19 Limitations

The findings may not be generalized to the population outside Botswana and subsequently to institutions that are not accredited by either BQA (Botswana Qualification Authority) or HRDC (Human Resources Development Council) or both. It is focused on instructional media and tertiary students' conceptualization of intended learning outcomes in Botswana.

1. 20 Chapter overviews

Chapter one provides the background of the research study. It provides the outline and formulation of the problem statement. It gives the aims and objectives of this study, research questions of this study, and the benefits and motivation of this study.

Chapter two covers instructional media schools of thought; namely: the strong and weak media effects. It also discusses the learning theories that explain how learning takes place, the principles of learning, the concepts of effective teaching and learning, models of instructional media usage and the thinking styles of the learners. Lastly, the rate of

return to investing in education, deals with looking at education as an investment; that should yield returns to the investor. In this study, Rate of return to investment (ROI) is concerned with the benefits sought after investing in instructional media at tertiary level of education.

Chapter three presents the research methodology and research design. It also presents the population and sample, sampling method, data collection procedure and data analysis plan.

Chapter four presents the analysis of data from questionnaire.

Chapter five presents the findings, recommendations and conclusions.

1.21 Summary

This chapter introduced the background, aims and objectives of this study, the statement of the problem, the motivation of this study. It also provided the outline of research methodology, population and sampling method, and chapters' overviews. The next chapter reviews the literature on instructional media and tertiary students' conceptualization of intended learning out comes.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

In today's learning environment, there is no question about using instructional media in the teaching and learning process. Instructional media is used to reinforce, motivate, and generally improve the conduciveness of the learning environment. Huge sums of money are spent every year in order to procure or improve the existing instructional media. Considering the financial aspect of instructional media, the question that comes is whether instructional media influence academic achievement of a student at tertiary level of education.

2.2 Conceptual framework

The debate between Robert Kozma and Richard Clark of 1994 marks the point of departure on the effectiveness of instructional media in the teaching and learning process (Marx 2006). The debate seems to be more about technology and its ability to help students learn better. Clark and Kozma's great debate focuses on whether technology or media affect the learning process or is media just the vehicle for instruction (Moffat 2013.01). The origins of this debate started when Richard Clark's article published in 1983 down played the role of media to a mere delivery mechanism(Moffat 2013:01). Ten years later, Kozma wrote a rebuttal to Clark's contention thus began the debate of media versus method (Moffat 2013).This debate, brought two schools of thought on the effectiveness of instructional media in academic achievement, when Kozma in 1994, opposing Clark contended that, media itself can influence learning under certain conditions and with proper process. Kozma believes that instructional media could and should be used more than a vehicle for delivery. He

viewed both instructional media and method to have a crucial role in the design of instruction (Moffat 2013). Kozma discussed how books, television and computers influenced the process of learning, connected learners to their prior knowledge, and helped learners to understand complex concepts. Whereas, on the other hand, Clark in 1994, argued that; it is the method rather than media that influences academic achievement (Marx. 2006:02). The basic idea of Clark's argument is that teaching methods have the most influences on learning. Instructional media is merely a delivery device and has no significant difference in learning outcomes (Moffat 2013). Clark (1983), who studied the most current summaries and meta-analysis of media comparison studies, from 1960s to the 1980s maintained that media do not influence learning under any conditions. Clark (1983) argues that, the media comparison studies do not acknowledge other confounding variables such as the method, the teacher, the content and the environment; which play a significant role in teaching and learning process. Thus Clark (1983:445), concludes, "The best current evidence is that media are mere vehicles that deliver instruction but do not influence students achievement any more than the truck that delivers our groceries causes changes in our nutrition." Thus, Clark's analogous comparison of instructional media and groceries truck makes an interesting argument that, the choice of the vehicle might influence the cost or the extent of distributing instruction, but only the content of the vehicle can influence achievement (Clark 1983:445).Put simply Clark (1983), argued that, it is not instructional medium, but, the content, that enhances the conceptualization of intended learning outcomes. Clark (1983:456), argues, further that "All current views of media comparison studies suggest that we will not find learning differences that can unambiguously attributed to any medium of instruction. It seems that existing research is vulnerable to rival hypotheses concerning the uncontrolled effects of instructional method and novelty."

On the other hand, Kozma (1994) argues that, media can influence learning, and that instructional media can enhance conceptualization of intended learning outcomes. Kozma (1994) argues that, instructional media influence learning under certain conditions with proper process, here Kozma's argument is that one cannot say with certainty that instructional media cannot influence learning, when instructional media

influences learning in certain conditions. Kozma contends that, the studies, carried out which Clark (1983) refers to, failed to establish a relationship between instructional media and learning because the theories, research and designs have been constrained by vestiges of behavioral roots from which the discipline of education sprang(Kozma 1994:2). Furthermore, Kozma (1994), argues that, embedded in the comparative media studies included in Clark's 1983 review are primal stimuli and responses of the 'behavioral' paradigm. Media "stimuli" are classified and differentiated based on surface features of their technologies and their effect on learning is compared using "responses" on a test. In other words, Kozma (1994) disputes the findings and the conclusions by Clark 1983, that they were flawed, which is the reason why they failed to establish the relationship between instructional media and students' conceptualization of intended learning outcomes. Kozma (1994), challenges the view that, instructional media do not enhance conceptualization of intended learning out comes as proposed by Clark (1983), Kozma's main argument is that media and methods are extricably interconnected. Because the method that one adopts in the teaching and learning process has a bearing on the instructional media that is going to be employed during instructional delivery. Hence there is a degree of connectivity between the method and instructional media. This connectivity is the cornerstone of Kozma's argument that one cannot separate instructional method from instructional media. Kozma (1994),is of the opinion that missing in Clark's (1983) meta-analysis are any mentalist notions or descriptions of the cognitive, affective or social processes by which learning occurs, and the underlying structure and functions of media which might serve as the causal mechanism, which influences these processes. Kozma (1994) further argues that, however, learning is not receptive response to instructions. Rather, reasons out Kozma (1994), which learning is an active, constructive, cognitive and social process by which the learner strategically manages available cognitive, physical and social resources to create new knowledge. The creation of new knowledge occurs by interacting with information in the environment and integrating it with already information stored in memory. Thus, kozma (1994:3) asserts that, "We will understand the potential for a relationship between media and learning when we consider it as an interaction between cognitive processes and characteristics of environment". In this case, Kozma, transcends the idea that, it is the

cognitive domain that matters when it comes to learning, but that, the environment plays a significant role in the teaching and learning process. This means one cannot divorce learning from the environment, for instance, the learning environment may include instructional media such as; models , motion pictures, computers, literature , the teacher and the content to be taught, all these contribute to the learning environment, apart from the physical environment where teaching and learning is taking place. The macro environment (which includes the political, social, economic and technological) also plays an important role, in the teaching and learning. Considering all these, one cannot divorce instructional method from instructional media, because both are victims of the educational environment and the macro environment.

The debate between Kozma and Clark produced two schools of thought on the effectiveness of instructional media; that is the Strong media effect and the Weak media effect. However, even if these two schools of thought have produced the debate on the effectiveness of instructional media in teaching and learning, whether instructional media enhance conceptualization of intended learning outcomes, there is a group of researchers, such as Thrasher, Coleman and Atkinson (2011), who have produced mixed results, which support both schools of thoughts, although the strong media effect school of thought and the weak media school of thought seem to be dominant in this debate.

2.3 Review of Related literature

The instructional media effect schools of thoughts centre on, whether, instructional media do influence academic achievement or not? Current research for example, Peake, Briers and Murphy (2005), support the strong media effect school of thought whereas Cradler and Brighforth, (2005), support the weak media school of thought. Of interest to the current debate between Clark and Kozma are some researchers for instance Muir (2007), Thrasher, Coleman and Atkinson (2011) who confirm both schools of thoughts, that is the results show mixed findings supporting both schools of thought. It becomes imperative to conduct a descriptive survey on the effectiveness of

instructional media at tertiary level of education. Furthermore, technology in education is a versatile resource, since it can be suitable to many different teaching and learning styles. The same educational technology can be used with different learning theories such as the behaviorist, cognitive, and Gelstaltist theories of learning, for example; a computer can be used during the behavioral or cognitive aspects of teaching and learning. From these theories of learning, principles of learning have been derived by the proponents of the theories to guide how best learning can be achieved. Therefore, the use of instructional media in teaching and learning process is influenced by various factors such as; theories of learning, learning styles of learners, thinking styles of the learner, principles of learning, content to be learnt and generally the type of media (Heinich, Molenda, Russell and Smaldino ,1999).

Using educational technology is beneficial to the education system; however, it is a huge investment for example the U.S. during the period of 1999-2000, used an estimated $6.2 billion on instructional media (SIIA 2000:2). Education is arguably classified as a merit good which society considers very important for survival, and therefore, should be funded through taxes or public funding. (Smith 2012) All of the above factors call for an investigation of instructional media and conceptualization of intended learning outcomes or the role of instructional media in tertiary students' conceptualization of intended learning outcomes.

2.3.1 The Strong Media Theory

The strong media effect school of thought claims that, instructional media influence academic performance of students. This means that, learners who are exposed to instructional media learn more and perform better academically than those who are not exposed to instructional media, in other words, instructional media enhance conceptualization of intended learning outcomes. There are several researchers, such as; Isiaka (2007), Bada (2011), Gulek and Demirtas (2005), that support this school of thought. Rutz, Eckart, Wade, Maltibie, Rafter and Elkins (2003), found that instructional media influence academic achievement of students, when they evaluated the final

grades, in their study to compare technology-enhanced and traditional instruction for a course in statics. They found out that the Web assisted instruction mean of 76.1 compared to Traditional instruction at 67.8 percentage point. The mean difference is at 8.3 percentage point, showing significant difference between the means of those students taught using technology enhanced instruction and those taught using the traditional instruction, and this difference attest to the fact that technology impacts positively on students' conceptualization of intended learning outcomes. All the forms of technology used in this study, their means are above the traditional instruction mean of 67.8, and the mean differences range from 4.7 to 8.3. The results, then, support the strong media effects school of thought, and confirm that instructional media enhance the conceptualization of intended learning outcomes, thereby improving students' academic performance (Rutz et al 2003).

These findings, are in agreement with the results of Peake, Briers and Murphy (2005) who collected data on the relationship between student achievement and the level of technology integration by Texas agriculture teachers, and found that, "while there are no cause and effect relationships addressed in the study, the findings support that a positive relationship exists between the level of agriculture science teacher technology integration and students achievement in basic academic subjects"(2005:29).

Peake et al (2005), explain that the data presented on teachers' level of skill in administrative use of technology and on the teachers' level of skill in integrating technology, of the two variables, it is the teacher level of technology integration variable that most directly influences student achievement. Meaning here instructional media do enhance conceptualization of intended learning outcomes. Peake et al (2005), noted that while no statistically significant correlations were found at the inferential level for these variables, there were some "descriptively significant" correlations in this sample. The purpose of this study was to determine if a relationship existed between agriculture science teacher integration of instructional media and students' achievement. The findings show that there was, descriptively a positive low correlation between student achievement on the mathematics portion of the TAAS (Texas Assessment of Academic Skills) and teacher instructional technology integration level. (Peake et al 2005:28). In other words, the results of Peake et al (2005), confirm that there is a positive

relationship between instructional media integration and students' academic achievement, which means that, although the primary objective of the research was not a cause –effect relationship, but the results support that instructional media has a link or relationship with students' academic achievement, meaning that instructional media enhance conceptualization of intended learning outcomes..

These above findings are also consistent with the findings of Shuratuddin (2001), who carried a study on "Internet instructional method effects on student performance"; the conclusion drawn from the studies was that, "internet instructional method does have significant effect on student performance."(p5)This is, based on several statistical data, of which, are the mean for coursework: 72.13 and 77.54 for convectional teaching method and internet method respectively, showing that the internet has significant effect on students' performance. All t calculated values are greater than the theoretical value of t, thus making the difference significant. Thus Shuratuddin (2001:5), concluded, "Since all sub –hypotheses, H1, H2 and H3 are rejected, it is possible to state that Internet instructional method does have significant effect on students' performance." In other words, instructional media enhance conceptualization of intended learning outcomes. The results, then further support the strong media school of thought, One aspect to note is that the findings of Shuratuddin (2001), do not base on one aspect, but three aspects, that is course work, examination and overall mark, meaning that instructional media effect is seen across the spectrum of the teaching and learning process.

Mwei, Too, and Wando (2011), who also investigated, "computer assisted instruction on student's attitudes and achievement in matrices", found that there was a significant difference between students who used computers and those who did not and they concluded that there was a significant difference in the Mathematics achievement.

Their results show that the pretest means are similar; experimental group at 11.11 and control group at 10.03 respectively. The results also show that the posttest means are different; the experimental group at 53.09 and control group at 32.62 respectively. This, then, is attributed to use of Computer Assisted Instruction(CAI), thus the difference in achievement between the experimental and control groups, can be the basis to conclude that, computer assisted instruction enhance the conceptualization of intended

learning outcomes. In other words CAI improves academic achievement of learners. Thus the findings of Mwei et al (2011), confirm the strong media effect theory, that instructional media enhance conceptualization of intended learning outcomes. The difference in the means between the control group and the experimental group is significant at 20.47 points, showing that; instructional media has a significant effect on the conceptualization of intended learning outcomes. In other words, instructional media do benefit students in that, it improves their academic performance, thus, students who are exposed to instructional media do better academically as opposed to those students who are taught without instructional media.

The above research findings are also consistent with the findings of the Software and Information Industry Association (SIIA), which studied 311 research reviews and original research projects and reported that “Positive effects have been found for all major subject areas, in preschool, through higher education and for both regular and special needs students…” (SIIA 2000:4), although, SIIA has not produced statistical evidence to support its claim, the information it provided in its study, confirm its position regarding the use of educational technology during the teaching and learning process.

Marx (2006:9), who also studied a number of research findings, on the effectiveness of instructional media in the teaching and learning process, concluded from a number of studies that, “I believe that the studies used in this paper show that media can influence learning. When Technology is applied using unique and innovative methods.” This assertion by Marx (2006), lays a condition that might be satisfied in order for instructional media to be effective, that is the, “the uniqueness and innovative methods”, meaning that, instructional media may not yield desired results if it is used in an ordinary manner without any innovation. Marx (2006), is in agreement with Kozma (1994)’s assertion that instructional media and instructional method are inseparable. The views of Marx (2006), kozma (1994) above are antithesis to Clark (1983), who sees the two: instructional method and instructional media as separate entities. This assertion of Max (2006) is in agreement and is supported by the International Society for Technology in Education (ISTE 2008), that monitored studies on the effectiveness of education technology on student outcomes for more than 20 years, concluded that, “When implemented appropriately, the integration of technology into instruction has a strong

positive impact on student achievement"(p5). This view of ISTE (2008) is consistent with Marx (2006), Kozma (1994), and SIIA (2000). The ISTE (2008) provides interesting statistical evidence, such as those of Michigan Freedom to Learn (FTL), which provided laptops to 8thgraders.The 8th grade math's achievement doubled from 31% to 63% between 2004 and 2005 (ISTE 2008:5). The science achievement jumped from 68% to 80% between 2003 and 2004. If one is to go by this statistical evidence, then instructional media's impact cannot be questionable, since mathematics increased within a year by 32%, whereas science, for the same period of one year increased by 12%. These then, reflect a significant increase especially mathematics and it is very possible to conclude that instructional media do enhance conceptualization of intended learning outcomes, thus, supporting the strong media effect school of thought.

A program in Missouri called; enhancing Missouri Instructional Networked Teaching Strategies (eMINTS) focuses on integration of technology into instruction (ISTE 2008:5-6). The eMINTS is an innovative instructional process through multimedia and computer technology. Evaluations of three eMINTS program involved quasi experimental studies, comparing students in eMINTS classrooms with those in non eMINTS classrooms in the same grades at the same school in Missouri between 2001and 2004 across an array of subjects. The results revealed statistically significant difference in performance between students in eMINTS and those students in non eMINTS. Students in eMINTS constantly outperformed those students in non eMINTS classes, for example, the mean of 41.7% for eMINTS and 34.64% respectively for the five years(ISTE 2008:6), showing significant difference between the control and experimental groups, thus, further supporting the strong media effect school of thought.

Onasanya and Omosewo (2011),compared, "Standard Instructional materials(SIM), which are instructional media that are usually purchased ready-made for teaching and learning purposes with Improvised Instructional materials (IIM) which are usually teacher made through creativity and modification of existing materials to suit the teaching and learning environment in the academic achievement of students", and concluded that, "there is no significant difference in the performance of students taught with standard instructional materials and those taught with improvised instructional materials" (Onasanya and Omosewo 2011:67).This conclusion further gives an

impression that , no matter what type of instructional media in use, during teaching and learning process, whether the instructional media is standardized, or improvised, instructional media enhance conceptualization of intended learning outcomes. During the teaching and learning process, teachers are encouraged to improvise instructional media, through creativity, modification of existing instructional materials, redesigning existing instructional media and adjustment of existing instructional media, if standardized instructional media is not available to aid conceptualization of intended learning outcomes, because instructional media is seen to be vital to students' conceptualization.

The results by Onasanya and Omosewo (2011), indicate that, there is significant difference at 0.05 level of significance between the pretest mean scores of the experimental and control group. This means that, the pretest mean score is significantly different from posttest mean score with respect to the use of standard Instructional materials. t-test was also used to compare the pretest and the posttest performance of students taught with improvised instructional materials, the result, is greater than the critical value, and Onasanya and Omosewo(2011)concluded that, the pretest mean score was significantly different from the posttest mean score with regards to Improvised Instructional Materials(IIM). (Onasanya and Omosewo 2011:72). After the t-test comparison of post test scores of the students in experimental and control groups, thus finally Onasanya and Omosewo (2011) concluded, "This concludes that the mean scores of the experimental group and control group are significantly different. This further shows that the standard instructional materials used in the experimental group had positive effect on the students' performance." In this regard, Onasanya and Omosewo (2011), findings and conclusion, support the strong media school of thought, which purports that, instructional media enhance conceptualization of intended learning outcomes.

Look (2005) reviewed a number of studies dating back as far as 1998 up to 2005, which is an eight-year study. In all these studies, there was a positive relationship between instructional media and student achievement, and then concluded that: "Despite some limitations in the scope of the research- based evidence, there does seem to be a sufficient body of data, both quantitative and qualitative, to determine a positive

relationship between increased use of educational technologies and student achievement. This is demonstrated directly, by increased scores on standardized testing…" (Look 2005:7). Look (2005), brings another dimension of "increased" use of instructional media, however, it seems that student achievement is connected to the frequency of use of instructional media in the teaching and learning process, and this exactly in agreement with the principle of teaching, usually referred to as the principle of repetition, which goes hand in hand with the principle of Thorndike's principle of effect and connectionism, which can be associated with Skinner's reinforcement principle. These studies conducted for a long period of time are consistent with the studies by SIIA, ISTE (2008), Max (2006), Kozma (1994).Gulek and Demirtas (2005), carried out a study on, the impact of laptops on students achievement. The results indicate that, there is a substantial difference between laptop and non-laptop students in terms of their end of course grades. A notably higher percentage of laptop students attained A grades and a significantly lower percentage attained F grades in their English and Mathematics courses. The largest difference between percent of laptop and non-laptop students obtaining A grades was in seventh grade English and the smallest difference was in eighth grade mathematics. One exception to this trend was that, a slightly higher percentage of non-laptop students obtained A grades in eighth grade English; however , results favored laptop students (90%) versus non-laptop students (79%) in terms of the percentage of students attaining a B or higher for English.(Gulek and Demirtas 2005:14),and concluded that instructional media enhance conceptualization of intended learning outcomes. The findings of Gulek and Demirtas (2005), thus support the strong media effect school of thought.

Further, to support to the strong media school of thought, is from Afolabi, Abidoye and Afolabi (2013), who compared the achievement of students who were taught Social Studies using instructional media and the students who were taught using the traditional method in Junior Secondary schools in Nigeria. The mean score of students taught social studies with instructional media is 59.3 which is far higher than those taught social studies without instructional media with a mean score of 41.The difference between the means of the two groups is significant, since t calculated value of 9.6 is greater than the t critical value of 2.00 at 0.05 level of significance. They, therefore,

concluded that, students that are exposed to instructional media during the teaching of Social studies performed better than the students that are not exposed to the use of instructional media in the teaching of Social studies. These findings are consistent with the findings of Adeogun and Osifila (2008),who also carried out a study to find the relationship between educational resources and students' academic performance in Lagos state, Nigeria, it was concluded that physical resource was significantly related to students' academic performance , and that , there is a significant relationship between material resources and students' academic performance.

Another study by Bada (2011), who carried out a study on computer instructional approach in Sculpture Education, and also concluded that, the application of computer instructional approach in learning environment, had significant influence on students' performance in sculpture (Bada 2011).The results, were subjected to Analysis of Covariance (ANCOVA), and it was concluded that, "students' creative ability has significant effect on their performance in sculpture development" (Bada 2011:132), thus, the conclusion, that the application of computer in learning environment has exerted significant influence on the students' performance in sculpture. The students with high and average ability performed significantly better than their colleagues with low creative ability. "The use of computer-graphic in teaching and learning of sculpture education, in Nigeria Universities should be encouraged" (Bada 2011:133). Thus, Bada's (2011) findings support the strong media effect school of thought. In other words, students taught using or employing instructional media perform better academically in comparison to the students taught using the traditional way. The above findings are also consistent with the findings of Acelajado (2012), in a study on the impact of technology or using technology on students' achievement, attitude and anxiety in mathematics. The t-values were computed which are highly significant, thereby suggesting that technology has impact on students' achievement. The difference between the pre-test mean score and the post-test mean score is significant , for instance on the HAG group, the difference is 52.39, mean gain after using instructional technology, on the AAG group, the difference is 53.80 and for LAG group is 52.97 mean gain, respectively. High Ability Group, the Average Ability Group and the Low Ability groups, all improved their

performance after being exposed to instructional media. Acelajado (2012) concluded that, instructional media enhance conceptualization of intended learning out comes. This therefore, gives another perspective of instructional media application in the teaching and learning process, that regardless of the cognitive ability of the learner, instructional media improves conceptualization of intended learning outcomes. This is supported by the fact that, the AAG had the highest mean gain of 53.80, and then followed by the LAG with 52.97 and lastly the High Ability Group with a mean gain of 52.39. In normal cases, one would have supported that; the HAG, should have gained more mean score, than the other groups, simply because they are a High Ability Group, however, contrary to the findings of Acelajado (2012), that instructional media do improve significantly students' academic achievement at varying degrees, regardless of the students cognitive abilities prior to application of instructional media. These findings further support, the other scholars' findings above, that instructional media enhance conceptualization of intended learning out comes, thereby improving academic performance of the learner, better than the counterpart who is not exposed to instructional media. Isiaka (2007), who carried out a study on the effectiveness of video as an instructional medium in teaching rural children agricultural and environmental sciences, concluded that, the use of video, Realia and chart improved students' performance in comparison to no instructional media group.

The findings by Isiaka (2007) show the net gain score, which is the difference between the pretest and the posttest, computed for the four treatment groups. The video group performance is slightly higher than the Realia group (56.75 and 56% respectively).The chart group scored 44%, while the No instructional media group scored 36.75%. The results suggest that; video can be an effective way of teaching. Looking at the mean gains, of instructional media, as opposed to No instructional media, at face value, shows a significant difference, which is video 56, 75 and No instructional media at 36.75, giving a difference of 20 point percentage, showing that instructional media, do enhance conceptualization of intended learning outcomes. Isaka (2007)'s studies seem to show individual instructional media's effectiveness, since the instructional media used had different degrees of enhancing conceptualization of intended learning out comes. Parette and Peterson-Karlan (2007), on assistive technology, also found out that

assistive technology which is described as, “a tool that allows a person to do a task they could not do without the tool at the expected performance.” Parette and Peterson-Karlan (2007), found that assistive technology is effective in students’ academic and life skills. These findings by Isaka (2007), Parette and Peterson-Karlan(2007) are consistent with the findings of Tarantino, McDonough and Hua (2013), who studied, effects of students engagement with social media on student’s learning, they then concluded that; the use of social media in academic course work can increase the learning achieved by individual students. They went on to say that student who participated in course work that utilized social medium demonstrated an increase in overall Grade Point Average (GPA) when compared with students who did not participate in social media. From their conclusion, brings another phenomenon in the instructional media controversy, where by social media do improve the conceptualization of intended learning outcomes, where the students community just communicate, sharing their learning activities in form of assignments, notes, problems ,discussions on content can enhance conceptualization of intended learning outcomes. Without close monitoring of activities on social media learning, failing to control confounding variables such as students sending each other responses to questions, sending each other clues, or conniving about the learning content and finally coming up with seemingly improved learning, when the learners actually connived on the social media. This may be difficult to conclude the effect of instructional media on the conceptualization of intended learning outcomes. Tarantino et al (2013), also found similar results on social media and learning: “Social media facilitate peer feedback on assignments and thoughtful student reflections on course content.” If not properly monitored, the use of this instructional media may result in rote learning where students may just parrot other students work, demeaning active learning which is associated with long life learning.

Liao (1999), carried out a meta- analysis of 46 studies on the effects of hypermedia on student achievement, found out that hypermedia instruction has moderately positive effects on students achievement over non-hypermedia instruction. Thus, Liao (1999:9) concludes, “The results from this study suggest that the effects of using hypermedia in instruction are positive over non-hypermedia instruction as a whole, however, the

effects may be varied depending on what type of instruction that hypermedia compares to." Kumar (2014) used a pre –test post -test experimental design on instructional strategies; modular instructional strategy, multimedia instructional strategy and control group. The purpose was to find out the achievement of learners taught using the three instructional strategies. The conclusion by Kumar (2014:183) was that, "The achievement of the group taught through Multimedia Instructional Strategy (I2) is better than that of the group taught through Modular Instructional Strategy (I1) and also that of the Control Group." In this case Kumar (2014) supports the strong media effect school of thought, that instructional media enhanced conceptualization of intended learning outcomes. Wong (2015) carried a study on technology acceptance in pre-service teachers of primary mathematics in Hong Kong, in which one of the research question-question 2 asked respondents the following question, "Do you find educational technology useful to your learning and your future teaching?..." 11 out of 14(78.6%) of interviewees expressed that the usefulness of technology was an important consideration for them. It was concluded that, "Our study shows that our pre-service teachers generally have a positive attitude towards the use of educational technology, and they have a favorable perception of its usefulness for teaching purposes (Wong 2015:731). The findings by Wong (2015) are consistent with the strong media effect school of thought. Furthermore, Montgomery, Hayward, Dunn, Carbonaro and Armrhein (2015), examined the role that technological innovation in a blended learning format could play in supporting instructor goals to support learner engagement for undergraduate students. They concluded that scaffolding, learner customization and promotion of lived experience, all result in meaningful learning (Montgomery et al 2015:667).The concept of meaningful learning connotes a comparative notion of learning "better" with or from instructional media, hence Montgomery et al (2015)'s findings go with the strong media effect school thought on the role of instructional media in conceptualization of intended learning outcomes among learners.

In conclusion, looking at the research findings above, the strong media effect school of thought holds that instructional media enhance conceptualization of intended learning outcomes. Regardless of the cognitive ability, the content taught, the level of the

learners and the type of instructional media being used whether standard or improvised, the bottom line is that, instructional media, do enhance, conceptualization of intended learning outcomes. Instructional media may not be looked in isolation, when it comes to the effects on conceptualization of intended learning outcomes, because the use of instructional media by the teacher is usually informed by the cognitive styles of learners, learning styles of the learners, the breadth and the depth of the concept being taught, among other factors.

2.3.2 The Weak Media Theory

The weak media school of thought purports that media do not influence academic achievement or conceptualization of intended learning outcomes. In other words, there are no academic achievement benefits for using instructional media, and there is no distinction in terms of performance between those students who receive instruction with instructional media and those without instructional media. Cradler and Brighforth, (2005:3) assessed over 100 research findings, and found that "…..studies generally and consistently show that technology alone does not have significant effect on teaching and learning." Although they have not given statistical evidence to justify their claim, suffice to say that, they further support their claim, "Technology is a tool that when used with tested instructional practices and curriculum can be an effective catalyst for education reform". They list conditions which are major factors necessary to support the effective application of technology to learning. Among these factors are: Technical assistance that is available when needed, staff development that is individualized to the needs of the teacher, understanding of ways to integrate technology into education reform, teacher access to technology during planning and long term staff development to support the integration of technology in to education.(p3-4). All these factors need to be put in to play so that instructional media can yield the desired results of promoting learning or aiding conceptualization of intended learning out comes. In other words, without these conditions or some of the conditions according to Cradler and Brighforth (2005), instructional media may not be effective to enhance conceptualization of intended learning outcomes, thereby improving academic achievement of the learners.

This implies that, for technology to enhance conceptualization of intended learning outcomes, it has to be accompanied by other factors in the teaching and learning process, such as the content, the method employed, the learning environment and also the learner, in other words technology alone cannot be accounted for academic achievement of a student academic performance. Although Marx (2006) and ISTE (2008) support the strong media school of thought, as noted earlier in section 2.2.1, they too contend that instructional media are effective in conceptualization of intended learning outcomes, if they are supported by other factors of teaching and learning process. This then, is the basis of the argument of the theorists in the weak media school of thought, that instructional media alone cannot be the only factor in the teaching and learning process, which can be attributed to the gain in learning, because teaching is a complex social interaction, stemming from various factors or activities. Simply put, there is no difference between students taught using instructional media as opposed to those taught using no instructional media when it comes to academic performance. Krennewell and Beauchamp (2003), who found out that, technology, had no impact on teaching and learning. When they compared Interactive whiteboard (IWB) and networked PCs and found that, among others, that IWB was effective in gaining students' attention, keeping their attention for a longer time, stimulating thinking and maintaining a focus on the subject matter rather than on the teacher or other students. The use of PCs, improved the legibility of students' writing. Creative writing was felt to be enhanced. However, there is qualitative information generally to support the fact that, there was no marked difference between the IWB and PCs, hence, the conclusion seemingly supports the weak media school of thought. In other words, the findings do not infer improved academic achievement; hence one might conclude that, the findings support the weak media effect theory. Similarly, Selimoglu and Arsoy (2009), carried out a study, on the effect of power point preferences of university students on their performance. They found that; there was no identifiable effect of instructional media on conceptualization of intended learning outcome, meaning that, instructional media do not improve the academic performance of the learners at all.

Selimoglu and Arsoy (2009), applied the regression analysis to further confirm if there was a significant difference. However, no significant results was found, and finally, they

concluded that, the results indicate students' preferences for PowerPoint have no significant effect on the examination scores. This conclusion then infers that instructional media do not enhance conceptualization of intended learning outcomes. Thrasher, Coleman and Atkinson (2011), who carried out a comparison study on web-based versus classroom instruction, and they concluded that, there was no difference between web based instruction and classroom instruction, since only one task out of ten tasks in their research findings supported that online class outperformed those of the traditional classroom. However, in six of the ten spreadsheet projects, performance was at least equal across both delivery methods. This is now a mixed bag, but one can extrapolate that, the research findings as indicative of the weak media theory, since six(6) out of the ten(10)projects actually, the two groups performed almost equally the same, and then, when one is looking at the law of numbers, then, the results seem to suggest that instructional media has no effect on the conceptualization of intended learning outcomes as envisaged by Thrasher et al (2011).Simply put, if six of the spreadsheet had the same results, that is between CBI and WBI, then, instructional media did not affect the academic performance of students. Thrasher et al (2011) comment thus: "The mixed results of this study further suggest that perhaps the real effect on student performance is not solely the delivery method, but rather a combination of instructional technologies, delivery method, richness of instructional media, and individual differences among students." Their comment is in line with (Clark 1983, Max 2006, ISTE 2008, Cradler and Bridgforth 2005), who have also observed that; it is not instructional media per se, that enhance conceptualization of intended learning outcomes, but a number of factors do impinge upon the conceptualization of intended learning outcomes. Here the issue of instructional media as a factor alone to impact on academic achievement seems to be discarded. Scholars from both schools of thought seem to be in complete agreement with the thinking that, instructional media alone cannot enhance conceptualization of intended learning outcomes without other factors, such as the teacher, the method, the content and the learner. Protheroe (2005), who argues that, "teachers, not technology, are the key to unlocking student potential." Thus, giving another dimensional factor of the "teacher" to consider into the current instructional media dispute. Protheroe (2005) is suggesting that, the teacher as a key

factor contributes much more, to the use of instructional media, thereby affecting or impacting on the students' academic achievement. This to some extent makes sense, since it is the teacher, who plans the content, organizes the teaching and learning process. The teacher also finds and uses instructional media, then teaches the planned lesson. Therefore, the teaching and learning environment is in the control of the teacher, who can be likened to a driver controlling the direction, speed, when to stop, how to stop at cetera of the car. In other words, Protheroe (2005,) argues that, the main actor in the process of instruction is the teacher who can either make it or not, even though instructional media is used, its effectiveness rests with the user –the teacher. Hossein and Shahid (2005), carried out a study on the, effect of PowerPoint presentation, as opposed to traditional presentation, focusing on the long term memory, such that students would recall more information in exams. The results indicate that, there were no differences between the two sections on exams and therefore, the use of PowerPoint had no effect on students' long term memory (p70),because it is the long term memory, that students depend on, when it comes to recall long time learnt content. In other words the findings and conclusions by Protheroe (2005), Hossein and Shahid(2005), confirm the weak media school of thought, Gweshe (2007), who carried out an experimental study to find out the influence of instructional media on students' performance in terms of academic achievement, when comparing agriculture concepts, taught using instructional media and those taught without the use of instructional media, and concluded that, there was no significant difference in performance between the students taught using instructional media and those taught without instructional media(p46).The performance for both groups; the control and the experimental, groups was the same and the difference was statistically insignificant.

The pretest mean of the students taught without the use of instructional media is 3.5 and the pretest mean of students taught using instructional media is 3.15. The mean difference is 0.2, which is statistically insignificant, showing that the two groups had the same assumed knowledge on farm records. The results indicate after the experimental group was taught using instructional media, given tests, the mean of the two posttest mean was 11.8 and that of the control group, students taught without instructional media , given the same two posttest as the experimental group(taught using

instructional media) the mean of the two tests for control group was 12.15. The control group, that is the students who were not taught using instructional media, performed slightly above those students taught with instructional media by 0.35. This is statistically insignificant. This therefore, shows that, both groups performed the same, meaning that, instructional media has no effect on the conceptualization of intended learning outcomes; thereby supporting the weak media school of thought which purports that instructional media has no positive impact on the learners' academic achievement, thus the findings are in agreement with Clark's 1983 assertion, that instructional media do not influence any academic performance of the learners

Nouri and Shahid (2005), carried out an experimental study "on the effect of PowerPoint presentation on students learning and attitudes, in managerial Accounting course", whilst the other group was taught, the same course using the traditional method. They concluded that, there was no differences in academic performance between those students taught using PowerPoint and those students taught using traditional delivery. The use of Power Point did not bring a difference to traditional instructional methods, when the results were compared. This study also examined whether PowerPoint presentations improve long term memory such that students will recall information better in exams than students in traditional classroom presentation. The results indicate that there were no differences between the two groups on exams and therefore, the use of Power Point had no effect on students' long term memory. Neither was there any interaction between students preferred representation styles and PowerPoint presentations affecting long term memory, again suggesting that PowerPoint had no effect on long term memory (Nouri and Shahid 2005:70).However, no differences were found on the students' attitude toward the instructor on measures of informativeness, effectiveness, time efficiencies and overall performance. Nouri and Shahid (2005) have not given quantitative data to support their hypothesis 2,which investigated the effect of PowerPoint presentation in students' long term memory and ,Hypothesis 2a which predicted an interaction between students' preferred presentation styles. Analysis of covariance (ANCOVA) was conducted with exams scores as the dependent variable, overall GPA as the covariate, and section as the independent variable. The effect of the section was statistically insignificant for both conceptual exams and exercise/problem

exercise at < 0.70 (Nouri and Shahid 2005:65).Since both the hypothesis 2 and 2a were rejected, it pointed that instructional media do not enhance conceptualization of intended learning outcomes. This further contributes to the weak media theory, that instructional media do not enhance conceptualization of intended learning out comes, and the above findings by Nouri and Shahid(2005) are in agreement with Clark (1983)'s assertion that instructional media do not influence learning at all.

The above findings are supported by Jain and Getis (2003), who carried out an "experimental research on the effectiveness of internet-based instruction", where students were taught Physical geography using Internet based lessons and the other group of students learning the same material via traditional classroom methods. "There was no significant difference in post-test scores between students who learned material in fluvial processes from the classroom instructor, in lecture format, and those internets –based lessons…" (Jain and Getis 2003:164).

A visual examination of the gains by groups showed differences between the control and experimental groups, but no clear trend could suggest significant difference among the groups. To get the difference between the groups, Culbertson et al (2004), used the ANCOVA method for statistical analysis, which used pre-test and post-test scores directly to determine differences between groups. The ANCOVA results indicated no significant difference among groups at the alpha level of .10, in any subject area in either group. In other words the results of analysis indicated that no significant difference existed between the achievement gains shown by each of the three groups in any of the five subject areas. Thus, the conclusion, "The results of this study did not support the claim that participation in modular technology course can increase the students' achievement in other academic subjects." This conclusion is consistent with the argument of Clark (1983), that media do not enhance conceptualization of intended learning outcomes. Thus Culbertson (2004), further support the weak media school of thought, that instructional media do not enhance conceptualization of intended learning out comes The findings here, by Culbertson et al (2004) are also consistent with the findings of Jain and Getis (2003), Nouri and Shahid (2005),the weak tradition of instructional media.

The report of the Examinations Research and Testing Division (ERTD), Ministry of Education, Botswana (2006) on the Botswana chapter of the Trends in International Mathematics and Science Study (TIMSS) project says that TIMSS investigated, among other variables, the availability of computers at home, books at home, computers in the school, use of computers during teaching and learning process, and availability of television and related gadgets at home.

It was reported that "there is no difference in mathematics and science performance between students who have computers at home and those who do not have" (TIMSS 2006:22).It is important to note that, having a computer and using a computer for learning purposes are two different things and some homes may have computer for Basic typing without necessarily having internet, so as to assist the student to search for information or to learn. Even when the computer has internet connections, it may not serve the purposes of learning, because the computer is subject to the interests of the user. It may be used as social media, rather than a search engine for academic purposes. Besides having computer at home, the study also looked at, use of computers and student achievement, it was reported that students who used computers did not perform better than students who do not use computers in mathematics and science (TIMSS report 2006:23). The results also indicated that students who used computers for learning purposes in this study for mathematics every day or once a week were reported scored significantly lower than students who never used computers for this purpose. The TIMSS (2006:225), reported that, "Most students (87.72%) come from homes without computers, but they do not perform any worse than students from homes with computers." This therefore, implied that, instructional media do not enhance conceptualization of intended learning outcomes, among student exposed to instructional media if students who are taught using computers do not perform any better than those students who are taught without the use of instructional media. It is safer to some degree to conclude that, instructional media do not improve students' learning, thereby not improving their academic performance. In other words, why should schools use a lot of money to procure instructional media, when students who do not use instructional media during the teaching and learning process perform academically the same and at times fairly better than the students who are exposed to instructional

media? In other words, use of instructional media without substantive and significant effect on students' academic performance, then translates into, resources that are not used to good use. The issue of opportunity costs is paramount when resources are scarce. In other words, when instructional media budget is met, it means other competing needs have been forgone. By funding instructional media, it is an opportunity cost that has been for gone in favor of instructional media.

The results from TIMSS (2006) are consistent with the results of the above mentioned scholars, Culbertson et al (2004), Jain and Getis (2003), Nouri and Shahid (2005) Selimoglu and Arsoy (2009) are among other scholars who support Clark (1983)'s assertion that instructional media do not influence any learning, that is to say, instructional media do not enhance conceptualization of intended learning outcomes or it does not influence any academic achievement of the learner, therefore, if these findings one has to go by, why do society or Governments use huge sums of money in procurement of teaching and learning resources in the form of instructional media? On the other hand, educational theorists such as Piaget, Bruner and others claim that, at certain mental age, students can conceptualize the intended learning outcomes abstractly. That is Bruner's symbolic stage and Piaget's formal operational stage of cognitive development. This mental age, is assumed to be operational when students are at tertiary level of education, and if one has to go by this assertion, why should society or governments spend huge fortunes of money to procure instructional media for teaching and learning process, when most of the students are assumed to grasp concepts abstractly?

2.3.3 The Mixed view of Instructional Media

There seems to be some research finding that one may call "Mixed findings" which supports both schools of thought; the strong media effects and the weak media effects schools of thought, when it comes to the effectiveness of instructional media in teaching and learning process. The debate between the Weak media effect school of thought and the Strong media effect school of thought has been going on up to date. As a result of studies being carried, there is emergence of research findings that support both

schools of thoughts, which one might call mixed results. Thrasher, Coleman and Atkinson (2011), carried out a comparative study on Web instruction versus classroom instruction, on ten spreadsheet projects. Interestingly, of the ten Spreadsheet projects assigned; the data analysis indicates that, students in WBI section of the course only outperformed the classroom students on the first project. Projects 3 through 7, indicated no significant performance differences across the delivery methods, and projects 2, 8, 9 and 10 indicated significantly better performance for those students in the classroom. They concluded that instructional media do not enhance conceptualization of intended learning out comes. However, the above research findings have three outcomes: the first is that, instructional media enhance conceptualization of intended learning outcomes, which is shown by the fact that Web based Instruction group performed better than the Classroom based instruction group in the first assignment. Secondly, that instructional media (WBI), and classroom instruction have the same effect on conceptualization of intended learning outcomes and this is shown by the fact that, both groups performed the same from assignment 3 to 7.Thirdly, instructional media has no effects on conceptualization of intended learning outcomes, and this is shown by the fact that, students in classroom instruction out performed those students in Web based instruction significantly. Thus, the research findings confirm both schools; the weak media effects and the strong media effects. If the law of numbers may be used to come to an informed conclusion about the research findings of Thrasher, Coleman and Atkinson (2011), 5 out of ten of the projects students in both groups performed the same, which means instructional media and traditional chalk, board and book have the same effect in students' conceptualization of intended learning outcomes, or alternatively instructional media has no superior effect on students conceptualization of intended learning outcomes when compared to the traditional ways of instruction. In four out of the 10 projects, the classroom students performed better than the WBI, meaning that, classroom instruction still is more effective in students' conceptualization of intended learning outcomes when compared to the WBI. The WBI group performed better in 1 out of the 10 projects. Looking at the law of numbers, which simply means that majority- which imply that the results of performing the same experiment a large number of times, the average of the results obtained should be close to the expected

value. It may be concluded that both ways of instruction are equally effective in the conceptualization of intended learning outcomes since 5/10, the two groups performed equally the same; thus neither confirming the strong nor the weak media effects schools of thoughts.

The above results are similar with the findings of Muir (2007), “on research summary on technology and learning.” It was concluded that, the results of the effectiveness of instructional media in conceptualization of intended learning out comes support both schools of thoughts. This is also consistent with the conclusion of Materi (2000:3), who admits that, “The media and learning debate will likely carry on; whatever the study, proponents in either camp will likely find fault with it.” This statement affirms the conclusion by Hastings and Tracey (2005:28), who claim that, “Whether or not the media of 1983 could, would, or should affect learning has never been resolved and likely never will be.” Maas et al (2008), argue that, “First we need to remember that technology is only one component of an instructional activity. Assessments of the impact of technology are really assessments of instruction enabled by technology, and the outcomes are highly dependent on the quality of the implementation of the instructional design.” Maas et al(2008), bring further insight into the complexities of measuring the effect of instructional media in the conceptualization of intended learning outcomes, that actually they seem to suggest that when one tries to measure the effectiveness of instructional media, you are measuring teaching not the instructional media effectiveness. Furthermore, instructional media enable instruction to take place, and this seems to agree with Clark(1983) ‘s assertion that instructional media do not increase the learning among students .Maas et al (2008:5) reaffirm their position on the effectiveness of instructional media on conceptualization of intended learning outcomes when they ascertain this, “Educational technologies cannot be effective by themselves.” This seems to agree with Kozma and other scholars, who believe one, cannot separate the effects of instructional media from the effects of strategies- instructional strategies. Suffice to say that, the battle still goes on, as researches are still being carried out to find the impact of instructional media and its benefits in the teaching and learning process, as summed by Clark (2001) that, there are four types of disputes (1) Which media are superior for academic achievement? (2)Which cognitive skills are cultivated

by a particular media? (3).What is the motivational aspects of different media? (4)What are the economic benefits of different media? This study focuses on last three of the above disputes identified by Clark (2001).

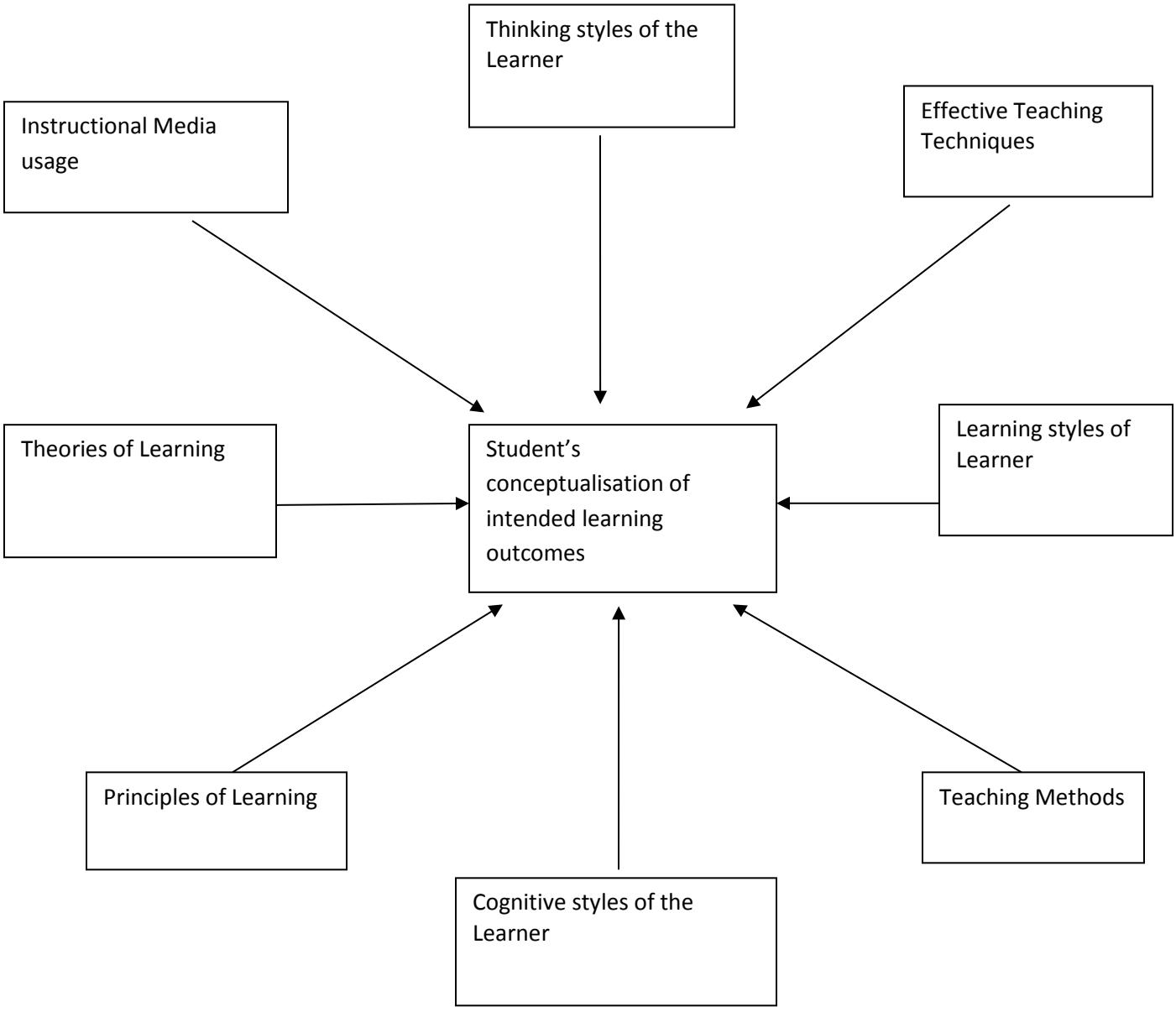
2.3.4 Factors that influence instructional media usage

The three schools of thought on the effectiveness of instructional media above; the strong media, the weak media and the mixed view on tertiary students' conceptualization seemed to have concentrated on instructional media only without greater infusion of the other factors. The other factors, for example include those factors that influence the selection of instructional media, the factors that influence the effective use of instructional media and the factors that influence effective conceptualization of intended learning outcomes. The following section of literature review looks at these factors briefly how they impacted on instructional media and tertiary students' conceptualization of intended learning outcomes.

2.3.4.1 Factors influencing conceptualization

The researcher, took the below mentioned factors Figure 2.1, as critical factors that influence tertiary students' conceptualization of intended learning outcomes. These factors contribute immensely to the learners putting the information in to the long term memory for later retrieval when the information is needed in situations that dictate the use of such stored in formation. Apart from conceptualization of intended learning outcomes, these factors mentioned below such as; effective teaching, thinking styles of the learners, theories of learning, teaching methods and the other factors to a greater extent influence the effectiveness of instructional media's capability to enhance conceptualization of intended learning outcomes. Therefore, research findings without taking in to cognizance these factors, have contributed to the arguments for and counter arguments on the effectiveness of instructional media in students' conceptualization of intended learning outcomes. The following diagram Figure 2.1 presents the critical factors that influence conceptualization.

Figure 2.1: Factors influencing conceptualization



The above factors in Figure 2.1 do impinge upon the effectiveness of instructional media during teaching and learning process. The arguments between Clark and Kozma of 1994, which brought about the two schools of thoughts; the strong media and the weak media, centered only on instructional media effectiveness, without considering the other variables mentioned earlier such as learning styles, principles of learning and others. That could have contributed to the current debate on the effectiveness of instructional media to go on without reaching a conclusive stance to the debate. Looking at both schools of thought, the argument was based on academic achievement only without considering other factors, that do impinge upon the effectiveness or not of instructional media in the conceptualization of intended learning out comes. The problem with Clark and Kozma's 1994 argument on media's effectiveness in the conceptualization of intended learning outcomes is that both of them generally singled out instructional media, without reference to other factors that influence the effectiveness of instructional media during the teaching and learning process. The researcher believes that the issue of whether instructional media enhance conceptualization of intended learning outcomes should not be a question, if the effectiveness of instructional media is not isolated from other factors of teaching and learning process. These factors include among other such as, cognitive styles, thinking styles, principles of teaching and learning, mentioned earlier on, and many other factors which do impinge upon the effectiveness of teaching and learning. Research studies on the effectiveness of instructional media in the conceptualization of intended learning outcomes so far seem to suggest that, there is little evidence to indicate that instructional media can be effective to enhancing conceptualization of intended learning outcomes without the influence of the other factors such as those mentioned above. In other words, if the argument between Clark and Kozma generally is void of the other factors of educational learning mentioned above, it is almost impossible to reconcile the effectiveness of instructional media on the conceptualization of intended learning outcomes. To test conceptualization of intended learning outcomes, as affected by instructional media, there should be a concerted effort to control the variables such as different thinking styles, cognitive styles, learning styles and above all acknowledge, the learning theory and the method(s) used to deliver the teaching and learning. In other

words, different methods, different teaching styles, different learning styles, and or different cognitive/ thinking styles, and content taught; to a large extend always produce different results. Therefore, for one to suggest that instructional media is effective, or not, in the conceptualization of intended learning outcomes, at least the factors above should be taken on board to effectively conclude the effects of instructional media on conceptualization of intended learning outcomes. This is supported by the argument by Liao (1999), who says, “Left unanswered is the question of what factors truly affect the diverse outcomes for different types of instruction.”

The diagram above summaries the factors that should be considered before a conclusion could be made on the effectiveness of instructional media. The variables definitely would be either confounding or extraneous variables, if not taken in consideration. This means that, instructional media’s effectiveness is not independent of factors that do influence the use and impact of instructional media and the conceptualization of intended learning outcomes. Conceptualization of intended learning outcomes is also influenced by factors such as instructional methods, instructional media, thinking styles, cognitive styles, learning styles of the learners, principles of learning, and theories of learning and effective teaching techniques. However, the variable of instructional media is also influenced by the other factors that affect conceptualization of intended learning outcomes as indicated below.

2.3.4.2 Factors influencing instructional media selection

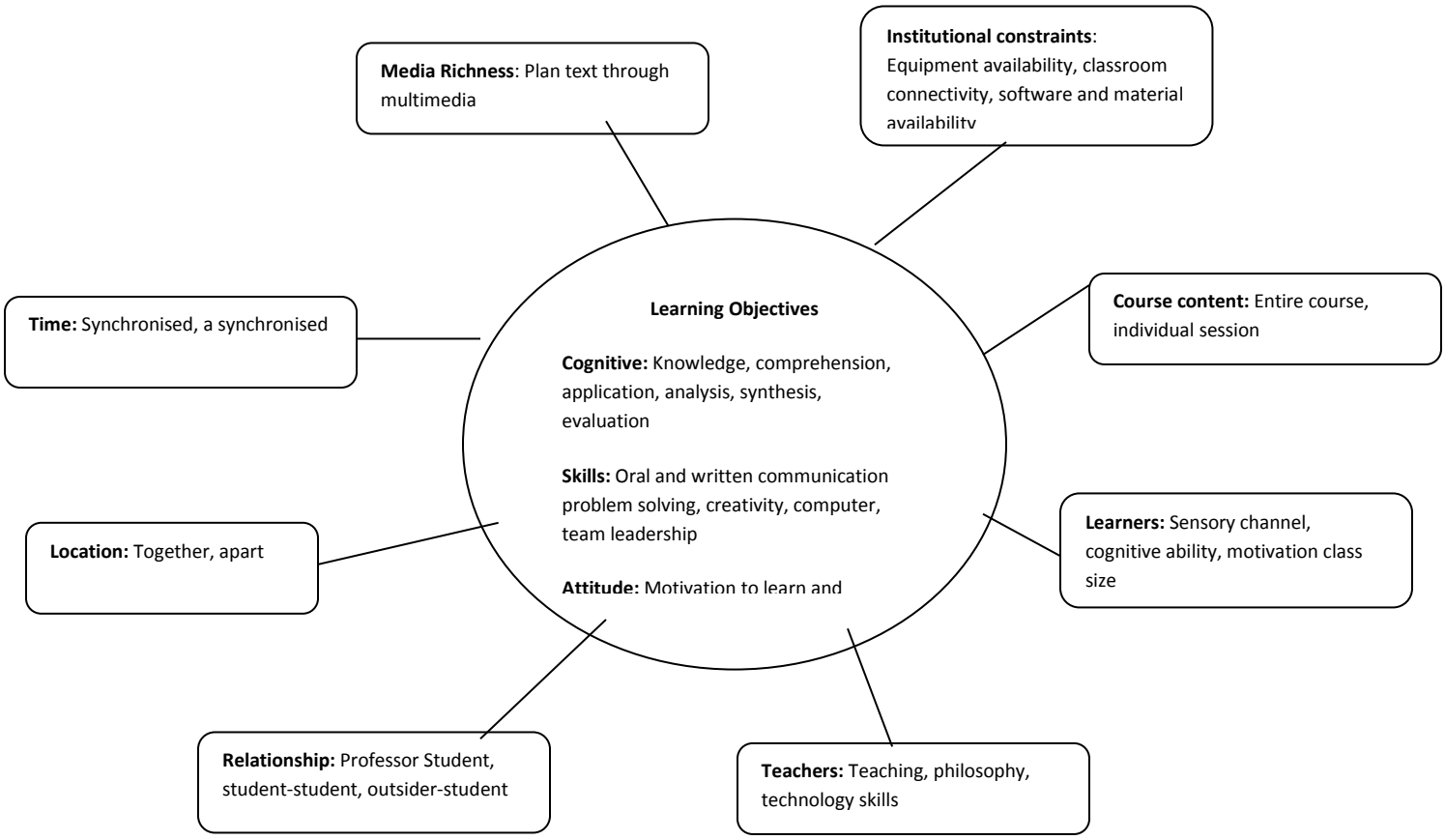


Figure 2.2: Factors affecting media selection

This model above, Figure 2.2 shows that the effectiveness of instructional media to be used in the teaching and learning process is influenced by various factors such as; instructional media's richness has an impact of what is learnt or what is to be conceptualized is made easier through multimedia. The concept of media richness is making a very important categorization, and this may be a source of a teacher reaching out to students' different learning styles or cognitive styles. The other factors include the teacher, and the teaching philosophy, the technological skills possessed by the teacher; the learner who plays a crucial role in determining the learning, learning theories and effective teaching techniques, the institutional constraints, location and time factors. All these factors do impinge upon the selection of instructional media. The effectiveness of

instructional media in tertiary students' conceptualization of intended learning outcomes is a function of the factors that influence the selection of instructional media. In other words, the model is purporting to suggest that educational technology alone is not a panacea to effective conceptualization of intended learning outcomes, but, instructional media has other factors that should be taken in to cognizance to make instructional media more effective in the conceptualization of intended learning outcomes at tertiary level of education.

Instructional media to be effective in order to enhance conceptualization of intended learning outcomes depends on different factors mentioned above *(see figure 2.1above).* When it comes to tertiary students' learning, students in tertiary education are considered to be adults and therefore, their learning is a fusion of the concepts of pedagogy (teaching of children) and andragogy (teaching of adults). Andragogy generally is argued that , since it is premised on Knowles' following assumptions: that adults have (i)Self-concept, as a person matures, his/her self-concept moves from one of being a dependent personality to one who is a self-directed human being, meaning learning is self-directed and students are generally intrinsically motivated to learn, which means at tertiary level students learning is a result of individual self-motivation, and this enhances conceptualization of intended learning outcomes(Erasmus and Dyk 2003:128-129). (ii) Experience, as a person matures he/she accumulates a growing reservoir of experience that becomes and increasing resource of learning, meaning experience plays an important part for the learner(at tertiary level of education) to conceptualize the intended learning outcomes, simply put; they draw from experience to conceptualize the intended learning outcomes. This helps the learners to understand the concepts. (iii) Readiness to learn is one of the principles of learning, developed by Thorndike. The principle of readiness states that as a person matures, his/her readiness to learn becomes oriented increasingly to the developmental tasks of his social roles, meaning that the readiness to learn is associated with their social roles, apart from this, readiness implies a degree of single-mindedness and eagerness (Erasmus and Dyk 2003:128-129, Madhurima and Sharma 2009:319).This principle of readiness is also associated with putting the learners in the right frame of mind to receive the new

learning of that day, thus preparing the learner to conceptualize the intended learning outcome. The principle of readiness is associated with setting of induction or the motivation phase during the teaching and learning process, to make learners, receptive, responsive and ready to receive the new learning, which is the concept that the learners need to conceptualize. (iv)Orientation to learning, as a person matures his time perspective changes from one of postponed application of knowledge to immediacy of application. Accordingly, this orientation towards learning shifts from one of subject centeredness to one of problem centeredness. In other words the immediate application of knowledge learnt, helps the learner to conceptualize the intended learning outcomes. Thus an indication of effective learning when the information learnt can be applied. (v) Motivation to learn, as a person matures the motivation to learn is internal. This is so, because learners have different maturity stages in the cognitive development; some are early maturers, some are late maturers, and others are generally fast and slow learners (Erasmus and Dyk 2003:128-129). This internal motivation makes the learners conceptualize the intended learning outcomes, because a need to learn is already within the learner and the need is the one that drives them to learn.

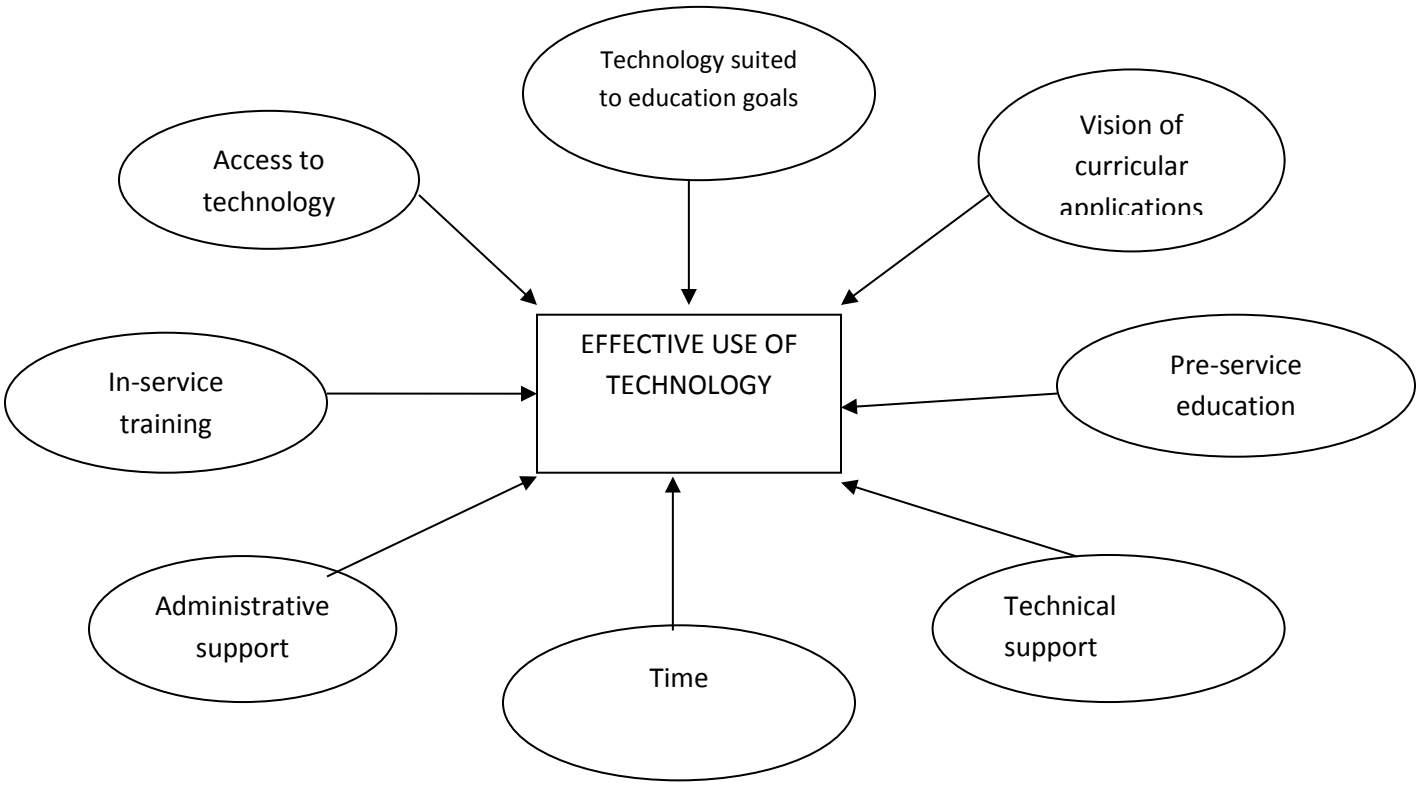
In other words students' achievement, at tertiary level of education, cannot be purely attributed to the use of instructional media as other factors do impinge upon the use of instructional media. Max (2006) asserts, "What I will take away from Clark/Kozma debate is that no media in and of itself has the power to really influence learning." Marx's (2006) argument here is that, instructional media alone cannot be accountable for the tertiary students' conceptualization of intended learning outcomes, because other variables in the teaching and learning process also play a crucial role in the process of tertiary students' conceptualization of intended learning outcomes.

2.3.4.3 Factors influencing effective use of educational technologies

It is important to note that several factors shown below figure 2.3 do impinge on the effectiveness of instructional media during the process of teaching and learning, and unfortunately research so far seems not to inclusively use the factors as variables to have a comprehensive understanding of the role of instructional media in the conceptualization of intended learning out comes. Some researchers have

independently attempted to focus on for example, students' cognitive styles and their academic performance, without necessarily linking it to instructional media, however, instructional media among other attributes during teaching and learning is credited for attracting attention, arousing interest, reducing boredom, increase level of attentiveness, provides variety, and stimulate readiness to learn. Cradler and Bridgforth (2005:4-5), suggest that, the following are minimum requirements for effective use of instructional media in education: suiting technology to education goals and standards, having a vision of use of technology to support curriculum, providing for both in-service and pre-service Training, and ensuring access to appropriate technology, providing for administrative support for technology use, providing time for teachers to plan and learn how to integrate technology and providing for ongoing technical support for technology use. This Cradler and Bridgforth (2005:4-5), present diagrammatically as follows:

Figure 2.3: Effective use of educational technologies



Adapted from Cradler and Bridgforth (2005:5)

Cradler and Bridgforth (2005)'s analysis is more of external factors that influence the effective use of educational instructional media in the conceptualization of intended learning outcomes. Two of important aspects that have an immediate link to learning in Cradler and Bridgforth's model are the aspect of technology suited to educational objectives. In other words for educational technology to effectively enhance conceptualization of intended learning outcomes should have a link to the objectives of learning. This is in line with Kozma's idea that content cannot be separate from instructional media. This means cradler and Bridgforth agree with Kozma's argument, that instructional media should be suited to what should be learnt, in order to be effective in conceptualization of intended learning .Clark argued that; the perceived effects of instructional media on conceptualization of intended learning outcomes is a mistaken effect of instructional method and content that is being taught.

It is therefore, important to look at learning theories next, in relation to instructional media and students' academic achievement. Learning theories try to explain how learners get the new learning. These learning theories are associated with advocacy of using instructional media during the teaching and learning process.

2.4 Learning Theories

Rhodes and Fincham (2005:22) explain learning as, "…the cognitive and physical activity giving rise to a relatively permanent change in knowledge, skills or attitudes." Farrant (1991:107) describes learning as, "...a process by which we acquire and retain attitudes, knowledge, understanding, skills and capabilities that cannot be attributed to inherited behavior patterns or physical growth." Morris (1988:176) define learning as, "…the process by which experience or practice results in a relatively permanent change of behavior." The above scholars attribute learning to the acquisition of knowledge, skills, competencies, attitudes and moral values, which will have an effect on individual behavior. This means that, learning has to do with conceptualization of intended learning outcomes. Learning can either be a process or a product; learning is both knowing what and knowing how (Roux, Loedolff, Louw and Roman 2010:46). Effective learning is seen by what the learner can do (psychomotor learning), think (cognitive

learning), and feel (affective learning) (Farrant 1991:107).Effective learning is assumed to occur due to the use of instructional media during the teaching and learning process. Effective learning is evidenced by everyday use of what is learnt to solve practical social, economic, environmental and other wise problems. It also refers to being creative, being proactive and suggesting possible and useful solutions on both micro and macro environment to advance human life in general.(Roux et al 2010).Learning theories are a set of explanations or ideas that seek to explain how learn takes place in individuals (Erasmus and Van Dyk 2003:119). The following are orientations to learning, herein referred to as theories of learning: the behaviorist orientation to learning, the cognitive orientation to learning, the humanistic orientation to learning and the social/situational orientation to learning (Erasmus and Van Dyk 2003:119). These divisions are arbitrary and some orientation may overlap. Learning theories are associated with the cognitive styles, thinking styles and learning styles of learners, which informs the teacher what type of instructional media that is needed to enhance conceptualization of intended learning outcomes among learners, with different learning or thinking styles. Learning theories tend to support both the strong media and the weak media. However, these theories do support instructional media usage at certain stages of cognitive development, which is at certain mental ages. These learning theories are the cognitive theory represented by the cognitive theorists such as Jean Piaget, Jerome Bruner, and Benjamin Blooms' The behaviorists' theory represented by behaviorism theorists such Ivan Pavlov, Burrhus Fredric Skinner and Edward Thorndike (Morris 1988:189). The Gestalt theory or the Gestalt orientation to learning; represented by the following gestalt theorists, such as Kurt Koffka, Wolfgang Kohler and Max Wertheimer. The humanist theory represented by Abraham Maslow, Carl Rogers, Malcolm Knowles, and John Holt. The social learning theory represented by Bandura, Salomon, Lave and Wenger (Smith 2003).This is why Rhodes and Fincham (2005:21), observed that learning theories are important in the conceptualization of intended learning outcomes mainly because "training designed with an awareness of how people learn is clearly more likely to be effective." Therefore trainers need an understanding of what might facilitate learning: for example, which instructional media or modes of delivery are most effective. The following is brief description of each learning theory mentioned above and

their implications to instructional media and conceptualization of intended learning outcomes.

2.4.1 Cognitive Theories of Learning

Fall (2003:1), explains that, “cognition is a collection of mental processes that includes awareness, perception, reasoning and judgment” Therefore, cognitive theories explain how cognition takes place during the process of conceptualization of the intended learning outcomes. The cognitive orientation to learning is represented by cognitivists such as Bruner, Piaget, Gagne, Ausabel and others (Smith 2003).

Piaget identified four stages in the cognitive development: **Sensorimotor stage**; (infancy) this is the period in which intelligence is demonstrated through motor activity without use of symbols (Farrant 1999: 108). Knowledge of the world is limited, but developing (Huitt and Hummel 2003, Wikipedia: 3-7), because knowledge is based on physical interactions or experiences. This stage is from birth to about two years. At this stage the child learns that it is separate from its environment and that aspect; of its environment continue to exist even though they may be outside the reach of its sense. Behaviors are limited to simple motor responses caused by sensory stimuli. Piaget divided the sensorimotor stage into six sub stages: simple reflexes (birth to six weeks), first habits and primary circular reactions (4 months to 8 months), coordination of secondary circular reactions (8 months to 12 months), tertiary circular reactions (12-18months) and internalization of schemes (18 to 24 months)(Farrant 1999:108).**Preoperational stage**: (toddler and early childhood), the second stage in Piaget’s cognitive development theory, and it takes place between two to seven years. Intelligence is demonstrated through the use of symbols, language use matures, memory and imagination are developed, but, thinking is done in a non-logical, non-reversible manner. The child’s thinking is influenced by fantasy (the way it would like things to be), and the child assumes that others see situations from its view point. The child makes in information and then changes it in its mind to fit its idea. Piaget noted that children in this stage do not yet understand concrete logic and cannot mentally manipulate information. Children’s playing and pretending takes place in the

preoperational stage, which has the following sub stages: the symbolic function and the intuitive (Huitt and Hummel, 2003 Farrant 1999).

Concrete operational stage: (elementary and early adolescence 7 -11 years), this is the third stage of Piaget's cognitive development. The stage is characterized by logical, systematic manipulation of symbols related to concrete objects. Operational thinking develops. Egocentric thoughts diminish. The important processes during this stage are: seriation, which is the ability to sort objects in order according to size, shape or any other characteristics, transitivity which refers to the ability to recognize relationship among various things in a serial order, for example a child can be asked to arrange books according to height and may start with the shortest to the tallest(Huitt and Hummel 2003), classification, which is the ability to name and identify sets of objects according to appearance, size, or any other characteristics, including the idea that one set of objects can include another. Decentering is where the child takes in to account multiple aspects of a problem to solve it, for instance, a short –wide cup normally can contain less than a wide-taller cup; reversibility-the child understands that numbers or objects can be changed and then returned to their original state, for example at this stage understands that a deflated ball is not gone ,but, can be filled with air again and put back into play , then is conservation, which refers to the understanding that quantity, length, or number of items is not related to the arrangement or appearance of the object or item. Finally, elimination of egocentrism; that is, the ability to view things from another's perspective (even if they think incorrectly (Huitt and Hummel 2003, Farrant 1999).

Formal operation stage: (adolescence and adulthood 11+years), in this stage intelligence is demonstrated through logical use of symbols related to abstract concepts. Individuals move beyond concrete experiences and begin to think abstractly, reason logically and draw conclusions from the information available as well as apply all these processes to hypothetical situations. At this point the person is capable of hypothetical and deductive reasoning. During this, the individuals develop the ability to think about abstract concepts. Sternberg (2003:455), states that formal operational stage involves mental operations and abstractions and symbols that may not have physical, concrete forms. This means that a learner is at formal operational stage of mental or cognitive

development, and conceptualization of intended learning outcomes may not need instructional media, since the learner is able to learn the new learning through symbols or abstractly. However, Huitt and Hummel (2003:3), caution and advice that cross-sectional studies of adolescents do not support the assertion that all individuals will automatically move to the next cognitive stage as they biologically mature. Data, from adolescent population indicates 30 % to 35 % of high school seniors attain the cognitive development stage of formal operational stage. This means that 65 % to 70 % of high school learners may never get to formal operational stage, implying that conceptualization of intended learning outcomes may need instructional media since they will be operating at concrete stage of cognitive development that calls for instructional media in the conceptualization of intended learning outcomes. Jean Piaget, viewed intellectual growth as a process of adaptation (adjustment) to the World (McLeod 2009, Morris 1988:354-355, Farrant 1991:108), and this takes place through the processes of assimilation, accommodation and equilibration. Assimilation refers to using an existing schema to deal with a new situation, whereas accommodation happens when the existing schema (knowledge) does not work, and needs to be changed to deal with a new object or situation, lastly equilibration is the state when a child's schemas can deal with most new information through assimilation. However, an unpleasant state of disequilibrium occurs when new information cannot be fitted into existing schemas (assimilation).Equilibration is the force which drives the learning process as we do not like to be frustrated and will seek to restore balance by mastering the new challenge (accommodation). Once the new information is acquired, the process of assimilation with the new schema will continue until the next time we need to make an adjustment (McLeod 2009).

Some researchers claim that some adults do not reach formal operational stage,(Huitt and Hummel 2003:3) meaning that their learning calls for instructional media, to enhance conceptualization of intended learning outcomes, since they would be operating at concrete operational stage. Concrete operational stage of cognitive development implies that cognition takes place through the use of concrete objects, which infer the use of instructional media. The formal operational stage implies that, learning can be achieved through the logical use of symbols related to abstract

concepts; at this stage, according to Piaget, high school and tertiary students can be taught successfully without instructional media to aid conceptualization of intended learning outcomes (Huitt and Hummel 2003).

Bruner's three stages of cognitive development: enactive, Iconic and symbolic stages are similar to those of Piaget. According to Bruner, the **enactive stage** :(0-1 years), and this appears first. It involves encoding action based information and storing it in our memory, and this is not limited to children, even adults can perform a variety of motor tasks, for instance typing, sewing, operating a lawn mower (McLeod 2012).

The **Iconic stage:** (1-6 years) is characterized by set of images that stand for the concept; here Bruner implies use of instructional media. This iconic stage, tallies with Piaget's concrete operational stage, where learning, should be through the use of instructional media at this stage. Bruner in the **symbolic stage**: (7 years upwards), contends that, learners are capable of conceptualize the intended learning without using instructional media. In this case cognition and conceptualization of intended learning can be achieved without necessarily using instructional media. Bruner's constructivist theory suggests that, it is effective during teaching and learning process, when faced with new material to follow a progression from enactive to iconic to symbolic representation (McLeod 2008). This means that, when giving instruction, the lecturer needs to move from known to unknown. Use concrete instructional media, to enhance understanding of the abstract concept .It would be easier for a learner to grasp the concept, especially if learning is organized simple to complex, general to specific, or concrete to abstract. Bruner's theory also suggests that, a learner of a young age is capable of learning any material provided that; the material is organized to suit that level of the learner (McLeod 2012). This means Bruner is saying that, you can teach anything to anyone provided you reduce the content to suit the cognitive level of that learner. Bloom's (1956) taxonomy of educational objectives, divided learning into three domains: cognitive, affective and psychomotor (Dyk and Erasmus 2003, Clark 2010). Generally of interest in education is the cognitive domain, which is concerned with how cognition takes place in the learner. Blooms (1956) in the cognitive domain classified educational objectives into six categories arranged from simple to complex: knowledge, comprehension, application, analysis, synthesis and evaluation. This shows that

learning should start with simple to complex and that learning becomes more complex and more theoretical, as the learner matures cognitively. Generally, learning according to Bruner, Piaget, and Blooms is from simple to complex, general to detailed, concrete to abstract. In this case, the cognitive theories of learning support the use of instructional media at certain stages of mental development, and at tertiary level of education, learners are assumed to be able to conceptualize the intended learning outcomes abstractly, without necessarily using instructional media.

2.4.2 Behaviorists Theories of Learning

The basic premise of the behaviorism theory of learning is that, behavior is learnt and behavior can be changed(Ormrod1999), in other words, learning is a relative permanent change in behavior due to experience(Rhodes and Fincham 2005:22, Ormrod 1999). The behaviorists such as Thorndike, Pavlov, Watson, Guthrie, Hull and Skinner (Smith 2009), all agree to the fact that learning has got to do with a person's response to a stimulus, and this is called Stimulus (S) Response(R) theory(Dyk and Erasmus 2003:119) In other words, the behaviorism theory of learning, implies that conceptualization of intended learning outcome, needs instructional media (Stimulus), that will stimulate a response in the learner, then a certain behavior is learnt. For instance, the Classical conditioning of Pavlov (Rhodes and Fincham 2005:22-24) was the first type of learning to be discovered and studied within the behaviorist tradition, hence, the name classical. Classical conditioning is a Stimulus(S) elicits Response(R) conditioning, meaning that behavior or learning can be learnt. In other words, there are natural responses, (reflexes), which are caused by Unconditioned Stimulus (UNC), because there is no learning involved in connecting the stimulus and response (Huitt and Hummel 1997). There must be also a neutral stimulus, which does not elicit a response, but, during conditioning, the neutral stimulus will be presented, followed by the unconditioned stimulus. Over time the learner will develop an association between the two stimuli, for example Pavlov's dog associated a bell with food, and then started to salivate, even if the bell rang without food, the dog salivated meaning that the dog was now conditioned. In other words, the bell in Pavlov's experiment became a Conditioned Stimulus and salivation became the conditioned response. This therefore, implies that in

educational set up, when for example, in academic subjects, a learner thinks of one of the teachers(stimulus), the way the lessons are delivered, the learner salivate psychologically, becoming ready to receive the new learning it's a result of being conditioned, to that stimulus-the teacher. Classical conditioning theory of Pavlov involves learning a new behavior through the process of association, in other words two stimuli are linked together to produce a new learned response in a person(McLeod 2008), the response is a conditioned response, simply it is a behavior that has been taught and now the behavior has become part of the learners' behavior. Pavlov noticed that, presenting a continued stimulus a number of times without being accompanied by unconditioned stimulus results in extinction of conditioned response, meaning that, for a learned behavior to continue, there should be some form of reinforcement, so that required behavior continues to exist in the learner, for instance, in the teaching and learning process, the teacher provides encouraging comments, such "Very well arranged and coherent piece of work" to the learner , and this reinforces that behavior of performing well in that particular aspect that has been reinforced. The operant conditioning of Skinner is another type of learning very similar to classical conditioning. This theory is called operant conditioning, which is a term used to describe behavior which has been reinforced by reward or discouraged through punishment. Skinner believed that, the best way to understand behavior is to look at the causes of an action and its consequences (Rhodes and Fincham 2005:22-29). Skinner's theory of operant conditioning was based on the work of Thorndike (1905)'s Law of effect (McLeod 2007).Skinner introduced a new term in to the Law of Effect, which is "reinforcement". Behavior that is reinforced tends to be repeated or strengthened; behavior which is not reinforced tends to die out or weakened (extinction). Skinner, in 1948, studied operant conditioning, which was similar to that one of Thorndike's puzzle box. (McLeod 2007).Skinner showed how positive reinforcement worked by placing a hungry rat in his "Skinner box", which contained a lever in the side, and as the rat moved about the box it would accidentally knock the lever, and immediately the pellet would drop in a container next to the lever, after that happened, the rate of lever pressing would increase drastically and remain high until the rat was no longer hungry. The rat would go straight to the lever, after being put back in that box in a few minutes, meaning that the rat

learnt, and associated the lever with food. The result, that the rat received food after pressing a lever ensured that the rat repeated the action time and again. This then was concluded that, positive reinforcement strengthens behavior. Skinner in this experiment also showed how negative reinforcement strengthens behavior. Negative reinforcement is the removal of an adverse stimulus or the removal of unpleasant reinforcers. Negative reinforcement was shown when Skinner placed a rat in his Skinner box and subjected it to an unpleasant electric current, causing some discomfort (McLeod 2008), as the rat moved about in the box, it would accidentally knock the lever, and immediately after knocking the lever, the electric current would be switched off. The rat, then, learnt after being put back in box would go to the lever, this is because of the consequence of escaping electric current, which ensured that the rat repeated the action again and again, thus, it was concluded that, negative reinforcement strengthens behavior, because it stops or removes an unpleasant experience. In this experiment, Skinner identified three types of responses or "operants" that can follow behavior: neutral operants, these are responses from the environment that neither increase nor decrease the probability of a behavior being repeated; then, reinforcers, which are the responses from the environment that increase the probability of a behavior being repeated. Reinforcers can be either positive or negative, and finally, the punishers, which are the responses from environment that decrease the likelihood of a behavior being repeated, thus punishment weakens behavior, by either directly applying unpleasant stimulus or removing a potentially rewarding stimulus. From this research, Skinner then, identified principles which can be used in education during the teaching and learning process. These principles that Skinner identified in his study are important to the use of instructional media and its impact on students' conceptualization of intended learning outcomes.

The following are some of the principles:

- Pleasant experiences (such as rewards or praise) are positive reinforcers. They cause learners to make desired connections between stimuli and responses.
- Unpleasant experiences (such as punishment) are negative reinforcers. They cause learners to avoid undesirable responses to stimuli.
- Continuous reinforcement increases the rate of learning.

- Intermittent reinforcement contributes to longer retention of what is learnt.
- Both positive and negative reinforcement can shape behavior.
- A lack of any reinforcement can also shape behavior. If people receive no acknowledgement of their behavior, they will likely change that behavior until they receive some kind of reinforcement.

Another behaviorism theory is that of Edward Thorndike's theory of connectionism. Connectionism is a Stimulus- Response framework, where learning is a result of association forming between stimuli and response. Such responses or habits become strengthened or weakened by the nature and frequency of S-R pairings (Culatta 2013). Thorndike's theory consists of three primary laws; the law of effect, the law of readiness and the law of exercise. The Law of Effect, states that responses to a situation which are followed by a rewarding state of affairs will be strengthened and become habitual responses to that situation(Culatta 2013).The Law of readiness, claims that a series of responses can be chained together to satisfy some goal which will result in annoyance if blocked, and the Law of exercise, states that connections become strengthened with practice and weakened when practice is discontinued(Culatta 2013). Thorndike came to these conclusions when he put a cat into a puzzle box, which had a lever inside that would open the door for the cat to escape from the box. After trial and error, the cat learned to associate pressing the lever (stimulus) with the opening of the door (Response). This Stimulus-Response is established, because it results in a satisfying state of affairs (escape from the box). This means that the law of exercise specifies that the connection was established because of S-R pairing occurred many times(the law of effect) and was rewarded(law of effect)Culatta 2013).All these principles deduced from the experiment emphasize the role of stimulus (instructional media) to induce a response. The responses that are reinforced and strengthened continue to be part and parcel of the learner, and those that are not reinforced are weakened, and do not form part of the learner (Fincham and Rhodes 2005:27, Dyk and Erasmus 2005:117-120).

In conclusion the principles of learning derived from the behaviorists' experiments which are important in the teaching and learning are; the principle of readiness, the principle of exercise/use or disuse, the principle of repetition, the principle of motivation and the principle of learning-association.

2.4.3 Gestalt Theory of Learning

(Morris 1988:7, Wikipedia 2012:01) explain that the operational principle of Gestalt (complete whole), is that the brain is holistic, parallel and analog, with self-organizing tendencies. Gestalt theorists stipulate that perception is a product of complex interaction among various stimuli, here implying instructional media. In other words the gestalt effect, which is the whole, is greater than the sum of the parts, is key to learning. Conceptualization of intended learning can be achieved through the use of the whole instructional media, instead of using media in parts for example digestive system– teaching parts of the digestive system in isolation, may not be effective than teaching holistically the whole system. These gestalt theorists such as; koffika, Wertheimer, Kohler (Morris 1988:6-7 ,Wikipedia 2012:20), saw objects as perceived within an environment, according to all of their elements taken together as a global construct. This “Gestalt” or “whole form”, forms the principle of totality, that learning must be considered globally, and learning takes place by means of assimilation, integration and perception of the overall situation (Dyk and Erasmus 2003).The theorists such as Kurt Koffika, Max Wertheimer and Wolfgang, saw objects as perceived within an environment according to all their parts taken together as a global construct (Weibell 2011).This “gestalt” or whole form approach sought to define principles of perception-innate mental laws that determined the way objects were perceived. The Gestaltists are interested in perception and behavior as a whole. The argument is that the whole is greater than sum of its parts. In short teachers should provide learners with the whole view or situation and insight learning, and that learners should be encouraged to look at the situation as a whole before attempting to find the solution to a problem. This implies that, if a teacher organizes class exercises in to “whole”, learners would be able to gain insight which would lead to the solution of the most of the problems. This means that, learners who learn by means of insight were in fact better problem solvers than those that learn by rote learning. In short, the use of whole instructional media needed in that particular lesson need to be availed during learning, for instance; in Agriculture education, when you debeak layers, show the learners all the materials such as nail cutter, hot iron, and knife that are used in debeaking. The whole media enhances

conceptualization of intended learning outcomes, if presented as a whole situation, since the Gestaltists advocate for a holistic approach to learning.

2.4.4 Humanistic learning theory

This theory purports that humans are sensitive and inquisitive, and act with the view to achieve personal objectives (Erasmus, Leodolff, Mda and Nel 2013:130). Humanistic theory views learning as a personal act by a learner in order to fulfill the learner's potential. As human beings, learners choose their behavior and not just respond in predictable way to stimulus, but motivation, choice and responsibility influence learning (Erasmus et al 2013). In other words, learning occurs by the educator acting as a facilitator that establishes an atmosphere in which learners feel comfortable to consider new ideas. Humanistic theory has it that learning takes place because of the belief that human beings have a natural eagerness to learn, which can be supported by McGregor's theory Y, that is, naturally people have an inclination to achieve something in life. Firstly, it is this inclination that becomes a need according to Maslow's hierarchy of needs, and that, the need to achieve something motivates a learner to learn under humanistic learning. Humanistic learning theory is more associated with democratic teaching style, which allows learners to ventilate their views about their learning, what they want to learn and how they want to learn (Dunn 2002). Secondly, the humanistic theory reinforces continuity to learn because it purports that there is some resistance to, and unpleasant consequences of, giving up what is currently held to be true and the most significant learning involves changing one's concept of oneself. This concept of oneself is close to the self-concept of Knowles's theory of andragogy, as opposed to pedagogy, states that, as one matures, his/her self-concept develops to that of being self-directed, and this makes learners motivated to achieve the learning outcomes(Erasmus and Van Dyk 2003:128-130). Here, like other learning theories, the issue of stimulus that solicits learning to take place infers instructional media to be used during teaching and learning process. Therefore, the humanistic theory purports the use of instructional media in the conceptualization of intended learning outcomes. The humanistic theorists (Abraham Maslow, Carl Rogers, Malcolm Knowles, and John Holt),

maintain that, students need to be empowered and to have control of their learning process. Thus, the self-directed learning it needs motivated and adaptive learners. Learning in the humanistic theory is student centered, feelings and knowledge are important to the learning process. A student learns because he or she is inwardly driven, derives his or her reward from the sense of achievement, and that need motivates learners to learn.

2.4.5 Social learning theory

This theory purports that people learn from interactions with other people. It emphasizes the role of language and culture in developing thinking(Erasmus, Leodolff, Mda and Nel 2013).The idea behind this theory is that all learning occurs in a cultural context and involves social interactions(Erasmus, et al 2013).This theory is facilitated through modeling and observational learning. It talks about how environment and cognitive factors interact to influence human learning and behavior. In other words, learning is a result of a learner's environment interacting with cognitive factors. This means that, an individual's acquisition of knowledge is related to observing others within the context of social interactions, experiences, and through modeling. It is learning through observing behavior, attitudes of others. Observational learning occurs when the learner observes, retains and replicates of the behavior that the learner has observed in the environment or from other people. In other words acquisition of learning competencies happens within a social group. This implies that learners in a social context get or receive the stimulus to learn from their immediate environment, in other words, the environment stimulates learning. This social learning theory support the nurture paradigm in the Nature-Nurture controversy, which is still going on whether learning is a result of innate conditions (nature) or environmental conditions (nurture) (Farrant 1991: 68-69).Learners in the social learning theory get the stimulus to learn from their surroundings, here, the social learning theory infers that, learning needs instructional media to enhance conceptualization of intended learning outcomes. It then, describes learning by association with the environment, in other words, cognitive development is a result of interaction between the minds and the environment. The concept of association is also

found in Pavlov, Piaget, skinner, Thorndike and Watson, that there should be some associations that exist for learning to take place (Culatta 2013).

All the above theories of learning, infer the use of instructional media, during the teaching and learning process, so as to enhance conceptualization of intended learning outcomes among tertiary students. It is therefore imperative to look at the best way of utilizing instructional media during the teaching and learning process, so as to effectively and efficiently put instructional media to good use for the benefit of the learners as proposed by Heinich et al(1999)'s ASSURE model.

2.5 The ASSURE MODEL (Instructional media planning and usage model)

All the above theories of learning imply the use of instructional media one way or the other to enhance conceptualization of the intended learning outcomes. However, to achieve conceptualization; instructional media should be used effectively. Thus, Heinich, Molenda, Russell and Smaldino (1999), developed a procedural model called The ASSURE model, which is supposed to assure effective use of instructional media in teaching and learning process. The Assure model is an acronym from taking the first letter of each stage of the procedure as follows:

A=Analyze learner
S= State objectives
S= Select instructional methods, media, and materials
U= Utilize media and materials
R=require learner participation
E= Evaluate and revise

2.5.1 Analyze learners

According to Heinich et al (1999), before beginning the process of teaching and learning, the educator must know the students' level, ages, ethnic group, sex, emotional, physical or social problems, and socio economic level. Specific entry competencies: which are prior knowledge, skills, and attitudes, to assist the educator determine lesson delivery strategies, techniques and tactics. Learning styles; that is

verbal, logical, visual, and or structured, should be analyzed, in order to determine the type of instructional media suitable for each learning style. It is important, to identify and analyze the learners, before establishing both instructional design and the instructional media for use in the instructional process. A thorough knowledge of the learners' characteristics enables the teacher to select suitable and the best instructional media in order to meet the objectives-the intended learning outcomes of that particular lesson. The learning style is important because the field dependent learners require more of concrete learning experience, and less of abstraction in their learning process. Those who have field independent learning style would prefer a more abstract learning experience and less of concrete learning experience in the learning process.

2.5.2 State objectives

The second step of the ASSURE model, is the stating of the objectives of instruction, which is a statement of what the teacher plans to put into the lesson, or of what the learner ought to get out of the lesson, and objectives should be learner centered. Stating objectives clearly is very important, because the objective becomes a standard for the teacher and the learner to measure whether the intended conceptualization has been attained or not during the teaching and learning process. The learning objectives should state succinctly clear the specific and the immediate behavior changes that are required in the learners. For the objectives to state clearly, the behavior changes that are intended in the learners, Heinich et al (1999), suggest that when writing objectives, one should use the ABCD of writing the objectives:

A stands for audience (who are your students), specify the learners whom objectives are intended.
B stands for behavior to be demonstrated, or what do you want them to do? The behavior or capability needs to be demonstrated as learner performance, an observable, measurable behavior, or a real world skill. Use an action verb for the capability or skill that learners have to acquire, for instance; draw, calculate, paraphrase etcetera.

C stands for condition under which behavior will be demonstrated, or under what circumstances or conditions are the learners to demonstrate the skill being taught. Be sure to include equipment, tools, aids, or references the learner may or may not use, and or special environmental conditions in which the learner has to perform.

D stands for degree to which the learned skills are to be mastered, or the degree to which the new skill must be mastered or criterion for acceptable performance (include time limit, range of accuracy, proportion of correct responses required, and or qualitative standards (Heinich et al 1999).

The objectives should cover the three domains of educational objectives proposed by Blooms in the taxonomy of educational objectives in 1956, which are; the cognitive domain, the psychomotor domain and the affective domain.. For example using the ABCD of the objectives one may write in “Agriculture” an objective like this one: “By end the lesson, students should be able to debeak ten birds using the hot iron method”. This type of the objective meets the ABCD criterion proposed by Heinich et al (1999).Analysis of the above example of a good objective, reveals that, the objective meets the criterion as follows: Audience(the students), Behavior(de beak),Condition(hot iron method) and Degree(ten birds, time factor-end of the lesson). This type of an objective shows the “condition” of the ABCD of the objectives, which infers the use of instructional media that should be used to enhance conceptualization of intended learning outcomes during the teaching and learning process. Apart from the ABCD of the objectives, one can use the SMART of the objectives, that is:

S stands for specific-that is the objectives should be specific.

M stands for measurable-that the objectives should be measurable

A stands for achievable-that is the objectives should be achievable

R stands for realistic- that is the objectives should be real

T stands for time span-that is the objectives should be time framed (Heinich et al 1999).

2.5.3 Select Instructional Methods, Media and Materials.

The third step in the ASSURE model, is to select instructional methods, media and materials, influenced by the following factors; learner characteristics, the

instructional/learning objectives, the content to be learnt, and the learning event. A thorough knowledge of diverse characteristics of the learners is very paramount to effective selection of instructional media, that will enhance conceptualization of intended learning out comes. It is very crucial that the selection of instructional media is informed by the theories of learning, the learning styles, cognitive styles of the learners and the content to be learnt (Heinich et al 1999).

Once you know the students, you have set the objectives or outcomes, and then you are ready to select instructional media, that would best suit your instructional method, the objectives and your students. Select materials that provide your students with the help they need in mastering the objectives. They could be in form of specific software programs, videotapes, overhead projectors, and computer and so on. These materials can be purchased and used as is or they might need some modifications (Heinich et al 1999). You can also design and create your materials for students to use. Heinich et al (1999)'s suggestion to select instructional method, media and materials is in line with the thinking of Clark (1983), that instructional media alone do not enhance any learning. it is in total agreement with Kozma (1994)'s contention that one cannot separate methods from instructional media, because they complement each other during the teaching and learning process. Both schools of thought seem to agree that instructional media enhance conceptualization of intended learning outcomes in combination with other factors of teaching and learning process.

2.5.4 Utilize Media and Materials

The fourth step in the ASSURE model is the central part of the ASSURE model. The instructional media, which is borne out of the analysis of the learners, the objectives, and the content to be learnt, is now available to be used in the teaching and learning process. It is important to take note that the instructional media do not infer or connote other meanings, which the learners "see", which the teacher may not "see", during teaching. This may compromise the enhancement of conceptualization of intended learning outcomes. In short, instructional media must denote what it is intended to achieve, than to connote other intentions, and this is the duty of teacher to verify

whether the instructional media being used in the teaching and learning process are actually denoting the intended learning outcomes. Where real objects or models are being used as instructional media, the teacher should decide either to use the holistic approach to instructional media suggested by the cognitive-gestalt school of thought or the parts of the whole as suggested by the behaviorism school of thought to learning. This is so, because the teacher during the teaching and learning process uses one or more of the learning theories, and apart from this, the selection of instructional media among other things, is informed by the learning method, which is also informed by the learning theory.

It's now the time to use the instructional media and materials that you have selected. You should always preview the materials that you have selected, before using them in a class, and you should use the equipment in advance to be sure it works and you know how to use it. Be sure to have a plan B, in case the equipment does not work. This is the moment that the instructional media is used to enhance conceptualization of intended learning outcomes, and care should be taken so that the instructional media represent the concept that one is teaching, otherwise the learners will be "seeing", other implications, and that would compromise and complicate the role of instructional media in the teaching and learning process (Heinich et al 1999)

2.5.5 Require Learner Participation

Students learn best when they are actively involved in the learning. The passive learner has more trouble learning whatever we try to "pour" into his/her brain, which is rote learning or the banking concept of education, where the lecturer assumes the learners are blank slates that need to be filled with information. Whatever your teaching strategy, you can incorporate questions and answers, discussions, group work, hands-on activities, and other ways of getting students actively involved in the learning of content. It is up to you, the teacher, to make sure that all your students have opportunities to participate in the learning activities in the unit plan. Allow students to learn as opposed to teach them. This is in unison with Edgar Dale's (1960) direct purposeful activities, where a learner is learning instead of being taught. It is also in agreement with Dr.

Kazembe's (1987) famous statement, "Teacher stop teaching and let the children learn". In other words, the learner should manipulate the instructional media, so that instructional media become learning media, as opposed to teaching media, so that, it aids conceptualization of intended learning outcomes. It is important to note that all theories of education agree that learners need to participate, during the teaching and learning process. Learners' participation is associated with learning as opposed to learners being taught. The participation of the learners reduces the banking concept of education (Freire 1996), where the teacher is the depositor and the learners are the depositories that need to be filled. The assumption that the learners are "tabula rasa", that is; they are blank slates, which is not true in most of the cases. Learners bring in to the classroom some form of background knowledge.

2.5.6 Evaluate and Revise.

Heinich et al (1999), argue that, this last stage is often neglected, but it is the most important one. Anyone can develop a lesson and deliver it, but really good teachers must reflect upon the lesson, the stated objectives, the instructional strategy, instructional materials, and assessment and determine if these elements of the lesson were effective or if one or more of them need to be changed the next time. Heinich et al (1999), give the following advice: "Sometimes a lesson may seem like it would be great, at least on paper. But then when you actually teach the lesson with a specific set of students, you might discover there were several things that seem not to work." Heinich et al (1999), continue to argue that, your expectations might be too high or too low. The materials used might not have been appropriate for the level or the material might not be very motivating. The instructional strategy might not get students interest to participate or strategy has been difficulty for you to manage. The assessment you used might have shown students did not understand what you tested for. This might mean that you did not accurately test for stated objectives, the method of assessment needs to be revised or the lesson did not permit enough time for students to master objectives Heinich et al (1999).

2.6 Dale's Cone of Experience

Dale in 1960s, on the other hand, working from instructional media point of view, developed what is popularly known as Dale's cone of experience, the cone of experience is a model that incorporates several theories related to instructional design and learning process (Anderson and Krathwohl 2009). During the 1960s, Edgar Dale theorized that learners retain more information by what they "do" as opposed to what is "heard", "read" or observed. Today, this "learning by doing" has become known as "experiential learning" or "action learning". From the Cone of experience, according to Dale the least effective instructional media is at the top, involves learning from information presented through verbal symbols, for instance listening to spoken word. Listening to verbal symbols is in line with Piaget's formal operation stage of cognitive development. It is also similar to Bruner's symbolic mode. Verbal symbols favor learners with field independent thinking style, or Kolb's abstract random learning style. It is apparent that Dale's cone of experience can be associated with other teaching and learning strategies to give more meaning to conceptualization of intended learning. Although Dale (1960) claims that, use of verbal symbols during teaching and learning is least form of instructional media, the same verbal or symbolic stage is seen by Piaget, Bruner as the highest level of cognition. On Dale's cone of experience, direct purposeful experiences represent reality on the ground or the closest thing, to real, everyday life. This implies that the teacher uses the real object or something very close to the concept being taught.

Below is adapted Dale's cone of experience, figure 2.4

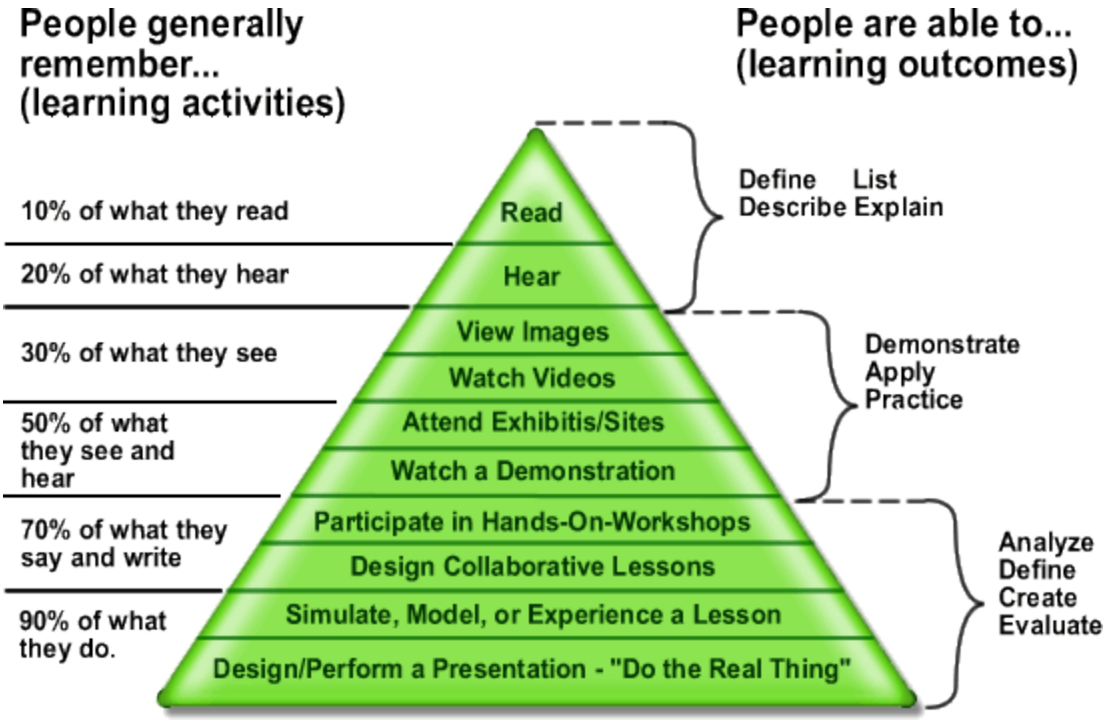


Figure 2.4: Dale's cone of experience Adapted from Pastore 2003:1

Dale's cone of experience shows that instructional media can be associated with Bloom's taxonomy of educational objectives in the cognitive domain. It may be associated with the improved taxonomy of educational objectives, by Bloom's students; Anderson and Krathwohl (2009). Dale's cone of experience seems to suggest that, when a learner hears and reads may be able to define, describe, and explain, as in Bloom's comprehension category of the cognitive domain. This is because they can only remember 10 % of what they read and 20 % of what they hear. When the learners use the following instructional media: view images, watch videos, attend exhibits/sites, and watch a demonstration to enhance conceptualization of intended learning outcomes; this contributes to 80 % of what the learners can remember, this contributes to the cognitive domain of Bloom's middle order objectives of the learners be able to demonstrate knowledge learnt, apply knowledge learnt and practice the knowledge learnt..

It seems that Dale's cone of experience echoes, the findings of Petty (1998:315), "It is important to note that research has shown information enters our brain in the following way: 87% by eyes; 9% by ears and 4% by other senses." However, regardless of the

sight having the highest percentage 87 % of information entering our brain, learners only remember, 30 % of what they see. On the contrary, information gets to the brain through other sense constituting 4 %, but, 90 % of that information is remembered by learners. This is in agreement with the old adage, “I hear and I forget, I see and I remember, I do and I understand.” From Dale’s cone of experience, it shows that, and 90% of what they do (I do, and I understand). Doing has an element of using instructional media, an element of practicum, participation and engagement of the learners in what they are learning. Dale’s cone of experience, also shows different types of instructional media and their supposed effect on conceptualization of intended learning outcomes in terms of percentages of enhancement of conceptualization of intended learning outcomes, for instance, learners can remember 70% of what they have learnt when they participate in hands on workshops and collaborative lessons. In other words, Dale’s cone of experience to some extent shows which instructional media have greater effects on the conceptualization of intended learning outcomes. This seems to answer what Clark (2001), suggested about four disputes among scholars concerning instructional media effect debate. The first dispute is concerned with, which media is superior in academic achievement in learners? In other words which instructional media has the most effective impact when it comes to conceptualization of intended learning outcomes? In this case, if one has to go by Dale’s cone of experience, it seems to suggest that direct purposeful experience at the bottom of the cone of experience, enhances about 90% of the conceptualization of intended learning. Learning deals with memory; that is remembrance and forgetting in education. However, caution must be taken when one associates remembering and intelligence, because teaching and learning is seen in two parts: teaching and learning as a process or teaching and learning as a product. Teaching and learning as a product is associated with encouraging rote learning, which results in the learners regurgitating what they have learnt verbatim without reflection, thus, negating the principles of effective learning. The direct purposeful experience is then followed by 70%, which is participating in hands-on workshops. Furthermore, a close look at Dale’s cone of experience reveals an alignment with Bruner or Piaget’s stages of cognitive development. Bruner’s enactive stage, iconic and symbolic stages fit well in the cone of

experience, for example; the direct purposeful experience of Dale, goes well, hand in hand with enactive stage, attending exhibits and watching demonstrations on cone of experience, goes well with Bruner's iconic mode of mental development and lastly, hear, read will fit well, the symbolic mode. Without instructional media, learning suffers from narration sickness, the lecturer assumes the role of a depositor and the learners become depositories to be filled with knowledge and these learners become passive recipients of information, where the lecturer assumes that the learners are tabula rasa or blank slate. This, then, results in the banking concept of education, where rote learning occurs. There are two ways instructional media can be used in the conceptualization of intended learning outcomes; that is, students may learn *from* instructional media or learn *with* instructional media. This is where the complication of instructional media effectiveness is furthered, because, you may not get the same results when learning *with* media or learning *from* media. This use of instructional media whether learning *with* media or learning *from* media depends on the lecturer. However, the debate on the effectiveness of media to enhance conceptualization of intended learning outcomes has now become riddled with semantics: learning with media as opposed to learning from media

In conclusion, all different theorists agree to the fact that learning needs instructional media, although, the cognitivists agree that instructional media is necessary for learning to take place, it is most effective when used at certain mental stages of cognitive development. Therefore, other stages of mental development, such as symbolic or formal operational stages, to some degree, instructional media becomes relative to use. This is simply because; learners have different learning styles, cognitive styles, and thinking styles. For example, a learner whose learning style is field independent understands the learning very well from symbols, and therefore, it may become optional for the lecturer or tutor to use instructional media, in the teaching and learning process. The learning theories mentioned above (*see section 2.3*) are also underpinned by cognitive styles or learning styles, that help the leaner to organize the learning, so as, to make meaning and understanding of that particular learning. In this case, then, it is imperative to briefly look at cognitive/learning styles, which inform the degree of use of

instructional media in the teaching and learning process, in order to view the role of cognitive styles in relation to instructional media in the conceptualization of intended learning outcomes by tertiary students(Fall, 2003, Bennett 2007).

2.7 Cognitive Styles/Learning Styles

Fall (2003), explains cognitive styles as referring to characteristic ways in which the individuals conceptually organize the environment. Bennett (2007:196-197), defines learning style as, "…a consistent pattern of behavior and performance by which an individual approaches educational experiences. It is the composite of characteristic cognitive, affective and physiological behaviors that serve as relatively stable indicators of how a learner perceives, interacts with, and responds to the learning environment. .." Therefore a learning style is the overall approach to learning, a typical and consistent way of perceiving and responding to learning tasks (Fall 2003).The cognitive styles or learning styles are used interchangeably, although some scholars distinguish the two, but for this study, they are seen as synonymous. Cognitive/learning styles are linked to the theories of learning, because they also try to explain how individuals can conceptualize and organize the intended learning, for better conceptualization of intended learning outcomes by the individual. Montgomery and Groat (1998) point out that there is a need to understand and incorporate learning styles in the teaching, thus, making teaching and learning a dialogue, culminating into active learning as opposed to rote learning. This active learning is rooted in the principles of learning for instance the principles of participation, repetition, effect or exercise; all emphasize active learning where the learner is actively involved in the learning process. Montgomery and Groat (1998) go on to say that it is their belief that when one incorporates learning styles in the teaching and learning process, the teaching becomes responsive to a more diverse student body. This simply means students are different in terms of their ethnicity, gender, age, nationality, cultural backgrounds, cognitive development, thinking styles and learning styles. All these factors mentioned above have different degrees of effect on the conceptualization of intended learning outcomes, and the instructional media to be used during the teaching and learning process. This is supported by Thornell

(1976:503), who argued that, “The sensitivity of the teacher in dealing with individual learner differences in cognitive styles in his/her classroom may be a significant influence in facilitating learning.” This then, helps the teacher to employ different instructional media, instructional strategies, methods, techniques, tactics, and to vary teaching styles, so as to reach out to the diverse studentship. Teaching principles have it that, although the teacher is facing a good number of students at the same time, it is assumed that teacher is teaching individuals, that is to be sensitive to individual differences during teaching and learning. The individual differences reflect the role played by the learning styles in the teaching and learning process. This means that the individual learning differences are reflected by the learning style that the individual learner possesses. Altun and Cakan (2006)’s claim that research findings have shown that there is a positive association between learning styles and student achievement, however, Altun and Cakan (2006), their own findings are contrary to the existing findings. They found an insignificant association between learning styles and student achievement. This therefore, means that, learning styles impact on the students’ conceptualization of intended learning outcomes, but, the extent of association varies, in other words, learning styles influence the type of instructional media and how instructional media is used to enhance conceptualization of intended learning outcomes. Two important learning styles that have researched extensively(Altun and Cakan2006, Atherton 2013, Bennett 2007:199),are the field dependent and field independent learning styles, proposed by Witkin, Moore, Goodenough and Cox (1977), which are similar to Pask (1969)’s Serialist and holistic learning styles(Atherton 2013, Bennett 2007:199). A learner, who is field dependent, for conceptualization of intended learning outcomes, needs external reinforcement, learns well with materials which are more concrete, relies on the surrounding perceptual field, has difficulty attending to, extracting and using non-salient cues; has difficulty in providing structures to ambiguous information; has difficulty restructuring new information and forging links with prior knowledge and has difficulty retrieving from long term memory(Altun and Cakan 2006, Bennett 2007:200).This implies that, for conceptualization of intended learning out comes to take place, instructional media forms the main part in the teaching and learning of a field dependent learner. In other words, a field dependent learner needs to

be exposed to instructional media, for conceptualization to take place. Field dependent learning style, then, goes hand in hand with Piaget's concrete stage, Dale's direct purposeful experience, Kolb's concrete experience and Bruner's iconic stages of cognitive development. This stage above is where the learners need concrete materials or instructional media in order to enhance conceptualization of intended learning outcomes, because they are not at the mental stage to assimilate any learning abstractly. The field dependent learning style also fits well in Dale's cone of experience, where different instructional media are presented and how much each category of instructional media is supposed to enhance conceptualization of intended learning outcomes during the teaching and learning process. The field dependent learning style then supports the strong media school of thought, because a field dependent student needs instructional media in order to conceptualize intended learning outcomes. Thus, field dependent learning style fits well with the strong media school of thought that purports that, instructional media enhance conceptualization of intended learning out comes, or students exposed to instructional media do learn more and academically perform better than the students who are not exposed to instructional media. Field dependent learning style is closely associated with dependent thinking style, which is the type of thinking that is dependent upon concrete information in a given situation. Learners with dependent thinking style need instructional media in order to critically examine given situations. This implies information that is based on concrete evidence, in this case, instructional media. When learners with a dependent thinking style, critically think, they need to "visualize" the situation from concrete experience in order to solve academic issues or to come up with solutions on practical issues.

On the other hand, field independent learning style is characterized by abstract, impersonal information, and can perceive object as separate from the field. Learners with this thinking style can dissemble relevant items from non-relevant items within the field. They can provide structures, reorganize information and they tend to be more efficient at retrieving items from long term memory (Altun and Cakan 2006).Learners with independent thinking style, they do not rely really on instructional media, to aid conceptualization of intended learning outcomes. They do well with symbols, and can learn abstractly, and therefore, independent thinking style support the formal operational

stage of Piaget, the symbolic stage of Bruner, or Dale's verbal symbols. In other words, students who are field independent can learn well without instructional media, to aid their conceptualization of intended learning outcomes, meaning that, when the field independent students are being taught during the teaching and learning process, they do not necessarily need instructional media and therefore, there is no need to use huge sums of money to purchase instructional media. The field independent learners are associated with independent thinking style, which allows them, to thinking independently of concrete situations or instructional media. Learners with independent thinking style, are able to respond to a learning environment, abstractly, and therefore can envisage possible solution to academic situations without reference to concrete evidence. Therefore, field independent learning style, supports the weak media effect school of thought, which purport to suggest that instructional media do not enhance any learning among students, thus supporting Clark (1983)'s assertion that instructional media do not enhance any learning. Most of these researches have linked these cognitive styles to academic achievement, that is to say, conceptualization of intended learning outcomes, depends on the cognitive style of the learner, however, Cakan and Altun (2006), carried a study to find whether cognitive styles have a relationship with students achievement, their findings revealed the following: Contrary to expectations, the results revealed insignificant correlation between participants' academic achievement and their cognitive styles. The results suggested that, cognitive styles had insignificant relationship with participants' achievement scores(Cakan and Altun 2006: 294)This is also in line with the findings of Friedel and Rudd (2006), who investigated the relationship between creative thinking and learning styles, their results revealed that: "There were no correlations between learning styles and creative thinking"(Friedel and Rudd 2006:109) The above findings are supported by Chun Shih and Gamon (2002) who carried a study on the relationship between learning styles and student achievement among other variables, they suggested that, "Student learning styles, patterns of learning, and characteristics did not have an effect on achievement measured by class grade in the web based courses of this study." (Chu Shih and Gamon 2002:8). The above results are consistent with the findings of Oh and Lim (2005), who carried out a study on Cross relationship between cognitive styles and learner variables in Online learning

environment and concluded that online learners' cognitive styles are not significantly correlated with learner variables." (p.62).

From the above findings by Oh and Lim (2005), then, concluded that students' preference of online instruction was related to their online experience and competency in using computer technology rather than cognitive styles.

In this case the field dependents and the field independents did not differ significantly in their academic performance, meaning that students who learn better with instructional media (field dependent) and those students who can learn abstractly (field independent), learned equally well. However, there is a link between theories of learning, and cognitive styles, because both try to explain how conceptualization takes place in a learner, with regards to instruction, in that both agree to the fact that some learners do need instructional media for conceptualization and others learn without necessarily being aided to learn by instructional media. In summary, the relationship between cognitive styles, thinking styles and theories of learning, means that, there are students who can learn and conceptualize the intended learning outcomes without the use of instructional media and those who need instructional media for conceptualization of the intended learning outcomes to take place (Fall 2003, Dyk and Erasmus 2003). The question is that, at tertiary level of education do media play significant impacts in the conceptualization of intended learning outcomes? Suffice to say researchers investigating the effects of cognitive styles on students' learning outcomes have not reached a consensus (Oh and Lim 2005); however, literature has comparison studies between field dependent learning style and field independent learning style. The findings from several researches confirm that, when it comes to student achievement; students with field independent learning style out performed those students with field dependent learning style. In other words, when it comes to academic achievement, students with field independent learning style have superior academic performance, although Altun and Cakan(2006), Oh and Lim(2005), have contrary findings, On the other hand, David Kolb in 1975 proposed four distinctive learning styles, explaining that people generally and naturally prefer a certain single learning style whose choice is influenced by various factors such as social environment, educational experience or the basic cognitive structure of the individual(McLeod 2013).Kolb(1975), argues that, what

determines the choice of learning style itself is actually a product of two variables or choices that individuals make, presented by Kolb as lines of axis(McLeod 2013). Kolb presented two continuums: the east- west axis, which he called the Processing continuum, which deals with how we approach a task, and the North-south axis, which he called the Perception continuum, that deals with emotional responses, or how we think or feel about it. Kolb named the four learning styles as follows: divergence, accommodation, converging, and assimilation. The learning styles, are describe as follows: Diverging learning style (feeling and watching)-the learners who use this learning style are characterized by being able to look at things differently or from a different perspective. Learners with diverging learning style are sensitive, and prefer to watch rather than do; they tend to gather information and use imagination to solve problems (McLeod 2013).They are best at viewing concrete situations from several different viewpoints. The learning style is called diverging because these people perform better in situations that require ideas-generation, for instance brainstorming (McLeod 2013). People with a diverging learning style have broad cultural interest and like to gather information. They prefer to work in groups, to listen with an open mind and to receive personal feedback. The other learning style by Kolb 1975 is the assimilating learning style (watching and thinking)-it is a learning style concerned with concise, logical approach, Ideas and concepts are more important than people. Learners who use this learning style require good clear explanation rather practical opportunity. They excel at understanding wide ranging information and organizing it in to clear logical formal (McLeod 2013). Learners with assimilating learning style are less focused on people and are more interested in ideas and abstract concepts. They are more attracted to logically sound theories than approaches based on practical value. Learners with this assimilating learning style prefer reading, exploring analytical models, and having time to reflect things thoroughly. The other learning style by Kolb 1975 is converging learning style; (doing and thinking)-learners with a converging learning style are able to solve problems and will use their learning to find practical solutions to practical issues. They prefer technical tasks, and are less concerned with people and interpersonal aspects. They are best at finding practical uses for ideas and theories (McLeod 2013). Converging learning style students can solve problems and make decisions by finding

solutions to questions and problems. They are more attracted to technical tasks and problems than social or interpersonal issues. They like experimenting with ideas, to simulate, and to work with practical applications (McLeod 2013). Finally, according to Kolb 1975 the last learning style is called accommodating learning style; (doing and feeling) - this is a learning style that is a hand –on and it relies on intuition rather than logic. The learners who use this learning style use other people's analysis, and prefer to take a practical, experimental approach. They are attracted to new challenges and experiences. They commonly act on gut instinct rather than logical analysis; they tend to rely on others for information than carry out their own analysis (McLeod 2013).Accommodating learning style is prevalent within the general population.

Similar to Kolb is Gregorc 1984, whose mind style model of 1984 provides how the mind works. The mind style model explains two important ways that the mind works: Perceptual quality, which was divided into concrete-which is a quality that enables an individual to register information directly through the five senses, such as smell, sight, touch, taste and hearing. When a learner uses concrete ability, the learner is dealing with the obvious, the here and now, and the learner is looking for meanings, relationships, as it is. The second aspect of the perceptual quality is abstract, - this quality allows the learner to visualize, conceive new ideas, and understand or believe that which one cannot actually see (Hawk and Shah 2007). When a learner uses that abstract quality, the learner is basically using intuition, imagination, and the learner transcends that which is the obvious to more subtle implications (Hawk and Shah 2007). People have both concrete and abstract perceptual abilities to some extent; each person is usually comfortable using one more than the other. The second way in which the mind works in Gregoric model is the ordering ability, which has two aspects: sequential ability, which is an aspect that allows the mind of the learner to organize information in a linear, step- by–step manner (Hawk and Shah 2007). When using the sequential ability, in this aspect, the learner follows a logical train of thought, have a plan rather than relying on impulse. The second aspect is the random ability, which is the learners' mind ability to organize information by chunks, and in no particular order. When the learner uses the random ability, may be able to skip steps, but at the end arrives and produces the desired results or findings. The learners using the random

ability are able to, for example start with the end, move to the first and back to the middle, but still producing required results at the end. Gregoric (1984), ordered these abilities into four combinations as follows: Concrete Sequential (CS), Abstract Random (AR), Abstract Sequential (AS), and Concrete Random (CR)(Hawk and Shah 2007).

An observation of these learning styles seems to show a trend of concepts of concreteness and abstractness as the core concepts in learning styles, where other proto types of learning styles are developed. For example, Kolb(1975), Gregoric(1984), for instance Kolb's learning styles have concrete and abstract, Bruner has iconic and symbolic, Piaget has concrete operational and formal operational, Dale's cone of experience has direct purposeful experience and verbal experience, Witkin et al (1977) and Pask(1969). It seems learning is seen from either an abstract or concrete point of view. This gives an impression that two approaches are apparent, that is, teaching using verbal symbols and teaching using concrete media. The learning styles and the learning theories above, both try to explain how learning takes place in individual learners. They are concerned with how cognition takes place within the individual, which is the process of conceptualization of intended learning outcomes. Generally, from the learning styles, and largely from the learning theories, the principles of teaching and learning have been derived to guide teaching and learning process so as to be effective and be beneficial to the learner. The use of instructional media is also largely informed by principles of learning. There are many principles of learning drawn; however, this study focuses on those learning principles as taxonomy.

2.8 Principles of Learning

Principles of learning are a set of guidelines or conditions necessary for teaching and learning to take place effectively. These principles of learning are derived mainly from learning theories and to some extent, from the cognitive styles, thinking styles, and learning styles. Learning principles are sometimes referred to as the laws of learning.

2.8.1 Principle of Readiness

Madhurima and Sharma (2009), state that individuals learn best when they are ready to learn, and they do not learn when they see no reason for learning. Getting the learner to be ready for learning is usually the responsibility of the educator. Readiness implies a degree of single-mindedness and eagerness (Madhurima and Sharma 2009:319).This principle, is associated with putting the learners in the right frame of mind to receive the new learning of that day by preparing the learner to conceptualize the intended learning outcome. It is associated with setting of induction or the motivation phase, to make learners responsive, receptive to the new learning, which is the concept that the learners need to conceptualize. Setting induction refers to any device, process or action which induces learners to attend and learn effectively (Madhurima and Sharma 2009, Farrant 1991). This principle of readiness to learn is associated with arousing interest to learn in the students. This principle of readiness to learn encompasses the physical, psychological, cognitive and emotional preparedness to receive and conceptualize the intended learning outcomes. In short for effective teaching and learning to take place the students should be ready to receive the new learning, thus, ready to conceptualize the intended learning outcome, otherwise without readiness of the learners, teaching and learning becomes futile. Farrant (1991:106) describes readiness as dependent upon appropriate maturation having taken place in the child's physical and mental development to enable the learner to learn specific skills. This means readiness may not be separated from the learners' cognitive development, cognitive styles and thinking styles. In short conceptualization of intended learning outcomes is a result of the learner's readiness to learn, in terms of their physical, psychological, emotional, mental or otherwise.

2.8.2 Principle of Repetition/Effect

The Principle of repetition or effect is a result of the findings of Thorndike's law of effect (Morris 1988:189), which was furthered by Skinner's reinforcement concept and to some extent to Pavlov's classical conditioning (Rhodes and Fincham 2005:24-25).Repetition is associated with improved learning that is when the learners repeat

several times what they have learnt, it is assumed that, they then remember that information and then put the information in the long term memory. This repetition also refers to continuous use of instructional media, putting the information learnt into long term memory, which is associated with lifelong learning, and this is the memory where learners retrieve information during examinations, thus repetition aids conceptualization of intended Learning outcomes. Repetition is important when the learners are exposed to key or important instructional media that trigger other information to come when the learner is confronted with an academic situation that needs retrieval of information from the long term memory in order to solve the situation. This principle of repetition or exercise is linked to Thorndike's connectionism, is that a connection between what is learnt and memory becomes strengthened with practice and it will be weakened when practice is discontinued (Culatta 2013). The principle of exercise or repetition has a "rule" developed by educational practitioners now in the teaching and learning process. "Whatever is taught, must be ever practiced", simply put, students should practice what they have been taught. Madhurima and Sharma (2009) reinforce this principle when they describe that the principle of exercise states that those things most often repeated are best remembered. It has the basis of drill and practice. In other words the mind cannot retain and apply new concepts after a single exposure, and every time practice occurs, learning continues. Thus the law of exercise, repetition or effect has it that conceptualization of intended learning outcomes is a result of the learner exposed to the stimulus continuously (Madhurima and Sharma 2009, Culatta 2013). This is the reason why educators leave instructional media such as charts, models or other materials at the disposal of learners so as to repetitively see them or use them in order to enhance conceptualization of intended learning outcomes.

2.8.3 Principle of Motivation

Learning is associated with motivation of the learner to learn. It is the duty of the educator to motivate the learners in his/her domain. Motivation is associated with rewards, as the saying goes, "what gets rewarded, gets done". Simply put in other terms, learners need acknowledgement when they do good, and this motivates them to

do better or continue to do good. It is associated with Skinner‘s reinforcement, basically referring to strengthening or emphasize a feeling, or an idea or a habit so that it may continue to exist in the learner (Farrant 1991:113). Motivation also refers to causing a process to continue or increase intensity. Motivation is associated with a stimulus which increases the probability of a response recurring. It is in line with Stimulus(S)-Response(R) theory of the likes of Skinner, Thorndike, and Pavlov to mention a few. Motivation can be inform of rewards (positive reinforcement), Negative reinforcement or punishment. The educator may positively reinforce by giving good comments, such as “very good, good trial, excellent work et cetera” Negative reinforcement, therefore is associated with negative effects on the learner for example, “Not pleasing, work below standard etcetera”, while punishment is the removal of a privilege for the learner from the learning environment, and it is a response from the environment that decreases the likelihood of a behavior being repeated. This punishment weakens behavior by either directly applying unpleasant stimulus or removing potentially rewarding stimulus. Therefore conceptualization of intended learning out comes is associated with reinforcement as motivation of the learners to retain what has been learnt. Instructional media reinforces what is learnt.

2.8.4 Principle of Participation

Participation of learners during the teaching and learning process, distinguishes rote learning from active learning, teacher centered approach from student centered approach, autocratic teaching style from democratic/participative teaching style. This then means the participation of learner is paramount to the conceptualization of intended learning out comes, simply by getting involved practically in their learning. All theories of learning infer that learners need to participate during the process of teaching and learning. It is associated with the principle of exercise, the principle of reinforcement. This means that, students will understand the intended learning out comes when they are involved by actually “doing” their learning. By actually participating, doing the “real thing” and this is Dale’s first stratum of direct purposeful

experience, contributing to 90 % of the conceptualization of the intended learning out comes.

2.8.5 Principle of Sequence

This principle deals with the organization of learning, in a form of some orderliness. The structure of the content to be taught should be arranged in a sequential order so that learners can easily follow what is being taught and what the learner is supposed to learn. It must be sequenced from known to the unknown, simple to complex, general to specific, part to whole, step by step, concrete to abstract (Piaget , Bruner). This is in agreement with Bruner's contention that anything can be taught to any one at any level provided that, what is taught has been reduced to the level of the learners and organized in such a way that the learner is capable of conceptualize the intended learning out comes. Erasmus, Loedolff, Mda and Nel (2013:200) argue that, to be most accessible, learning content and material should be delivered in a logical flow. They further state that, "Sequencing is the process by which the content and learning experiences are placed in configuration that will produce the most learning in the shortest possible time" (Erasmus et al 2013:200). The following are examples of the benefits of sequencing; it helps the learners to make transition from one skill or knowledge element to the other. It ensures that prerequisite skills or knowledge are acquired before new learning and knowledge are introduced. It prevents students' confusion and failure (Erasmus et al 2013:200). This is the reason why lessons are structured in a sequential order from lesson introduction, lesson development and finally lesson conclusion.

2.8.6 Principle of Feedback/Evaluation

An important aspect of teaching and learning is the principle of feedback/evaluation. It refers to the teacher providing some form of value judgment to the responses or activities of learner on how the learner has managed to match expected standards. It is a process which is associated with comments (written or verbal) given by the teacher to

the learner concerning the performance, the way forward, the weaknesses , the strengths or whether the performance is good or bad. This principle of feedback requires that feedback should be immediate before the learner has forgotten, and that such feedback is more beneficial than delayed feedback. Feedback has its roots in the Thorndike's law. This law of effect, states that responses to a situation which are followed by rewarding state of affairs will be strengthened and become habitual responses to the situation. The purpose of giving feedback to the learners is to strengthen their responses, so that the knowledge acquired becomes part and parcel of the learner. It is one of the ways of reinforcement, either positively or negatively. Feedback, forms part of Skinner's operant conditioning, and Pavlov's classical conditioning, in that, the responses that are not reinforced are weakened and may die out a natural death, while responses that are reinforced are strengthened and become habits (Dyk and Erasmus 2003:123).Intermittent feedback, contributes to long retention of what is learnt, and continuous feedback increases the rate of learning. The principle of feedback is also associated with the principle of recency, so that the educators, repeat, restate, or re-emphasize important point through question and answer technique at the end of the lecture or give exercises in form of written work in order to fulfill the principle of participation.

2.9 Rate of Return to Investment in Education

Education is an investment, as costs are incurred during the period of schooling. These costs are incurred by society and by the individual, for example; tuition fees, examination fees, travel and living expenses depending on the educational financing policy of that particular country. Botswana Government pays all fees related to educational costs, such tuition, book fees, practical fees, attachment allowance, kit allowance, protective clothing allowance for those who are taking courses that need protective clothing, and above all, it gives living allowance to every student at a current rate of 1400 Pula per month. Therefore, if education is seen as an investment, there is a need to measure the returns. When one invests in education, one needs to be aware of what returns one gets after investing in education. What a person gets after investing in education is what is being referred to as the rate of return on investment (ROI) in

education. The rate of returns in investing in education is based on the human capital theory, which tries to estimate returns on investment in education, based on the number of years of schooling and the total life earnings of that individual and the benefits accrued(Andolfatto, Ferall and Gomme 2000, Kessler and Lulfesmann 2002 Psacharopoulos and Patrinos 2002). Barker (2005:02) explains that "Return on Investment, is an accounting based method of comparing the costs and benefits of a product, program or service by converting all tangible costs and benefits to financial measures. It can be used, however, to include intangible costs and benefits, particularly as the concept is applied to public expenditures for education and training" There are several methods used to calculate the rate of returns to investment in education. These benefits of rate of returns to investment accrue both socially and privately. Psacharopoulos (2009:3-4) explains, "private returns are based on the costs and benefits of education, as those realized by individual student, for example how much he or she actually pays out of pocket to attend a high school education institution, relative to what he or she gets back, after taxes, in terms of increased earnings relative to control group of secondary school graduates who did not pursue tertiary education studies." Psacharopoulos (2009) further explains, "Social returns are based on the costs and benefits of education, as those are realized by state or society as a whole. The costs are all inclusive, i.e. they refer to what education really costs, rather than just what the student pays out of pocket".

Instructional media is one of the major indicators of cost in financing education, apart from salaries and recurrent expenditure. The U.S. Government during the period of 1999-2000, used an estimated $6.2 billion as expenditure on instructional media. Regardless of this huge amount used to finance education, Boser (2011) comments that the relationship between school funding and academic achievement is a subject of much debate within the education policy community. There are varied perspectives to education finance versus academic achievement. Boser (2011) brings out these perspectives which are a paradox. Boser (2011), states that some experts maintain it's possible to cut education funding without lowering achievement, while others argue that only influx of money can bring the achievement boost to schools so desperately needed. Researchers according to Boser (2011) do make a few things clear about

educational funding versus academic achievement, in that literature strongly calls into question the notion that simply investing more money in schools will result in better outcomes. At least above some threshold level, the research suggests that if policymakers allocate additional education dollars without any clear controls on how the money is spent, the funds do not appear to have a significant impact on achievement. But the literature reviewed by Boser (2011), also makes it clear that school spending can make a difference in achievement (p.12). Boser (2011:24), comments thus:

"The literature on productivity is limited, and there's a lot we don't know about the relationship between spending and educational achievement. It appears, for instance, that the link between outcomes and money is not always linear. In other words, even in an efficient school system, the first few dollars spent on a program or school might not have the same effect as subsequent expenditures." However, research findings by Psacharopoulos (2009), Psacharopoulos and Patrinos (2002) reveal that; higher education has more private returns as compared to social/public returns. An individual benefits more than the society, which usually financed that individual learner. When the learner at tertiary level can conceptualize the intended learning abstractly, why should more money be spent on the tertiary learner, when the results of researches show that society benefits very little compared to the individual, and more so when the learner is also a field independent, which means that, the learner does not need instructional media in order to conceptualize the intended learning outcomes. Psacharopoulos (2009), Psacharopoulos and Patrinos (2002) give statistical evidence of rate of returns, for instance:

Table 2.1: Private and social Returns by Regions

REGION	SOCIAL RETURNS %	PRIVATE RETURNS%
ASIA	11.0	18.2
EUROPE/MID EAST/N.AFRIC	9.9	18.8
LATIN AMER/CARRIBEAN	12.3	19.5
0ECD	8.5	11.6
SUB SAHARAN AFRICA	10.8	27.8
WORLD	10.8	19.0

Psacharopoulos and Patrinos (2002:13)

The above statistical evidence shows that, higher education has more private returns, meaning that an individual, benefits more than the society or state that has paid for that individual's education. With this scenario, it is therefore, arguable to continue as society to invest in tertiary education as compared to primary and secondary education that are considered to have more social benefits, in other words, society benefits more from an individual, whom it has educated up to secondary education, than from an individual it has educated to tertiary level. There are a good number of benefits that the society or the individual can get. McClendon, Jones and Rosin (2011: 8) explain that, the public economic benefits include: increased tax revenue, greater business productivity, increased consumption. Furthermore, increased work force flexibility and decreased reliance on Government financial support. Whereas, the economic benefits that accrue to individuals include: higher salaries and benefits, enhanced employment opportunities, higher savings level, improved working conditions and personal or professional mobility. McClendon et al (2011: 9), explain that, the social benefits enjoyed by the public are: reduced crime rates, increased charitable and community service, increased quality of civic life, social cohesion/appreciation of diversity and improved ability to adapt to and use technology. Whereas, individuals gain private social benefits, including improved health and life expectancy. Furthermore, an improved quality of life for children and dependents, better and more informed consumer decision making, higher personal status and more time for hobbies and leisure activities. In support of the above, Psacharopoulos and Patrinos (2002:18-19), provide data for three Sub Saharan African countries on social and private returns on Higher education, for instances, Botswana (1983) her social returns were at 15.0%, private returns at 38.0%. Malawi (1982), social returns stood at 11.5%, whereas the private returns stood at 46.6%, and finally Zimbabwe's (1987)'s social returns stood at -4.3% and the private returns at 5.1%. All these figures confirm that society generally benefits less in comparison to the individual learners. This means that the individual input in the cost of one's education in Botswana is minimal, because, the state caters for most of the learner's needs, however, if

individuals decide to give extra towards living allowance, it becomes difficult to basically include it as individual contribution towards education. Regardless of this state contribution which seems to be 100 %, the social benefits are less than half of private returns at 38 %.

It is clear, in Sub Saharan Africa, where Botswana is part, that individuals benefit more than a country. These impinge upon the development of that country, since the country after investing in the human capital, there is little that it reaps from the individual. In this case, since some tertiary education students can conceptualize the intended learning outcomes abstractly, and some have field independent cognitive styles, it is worth revisiting the issue of instructional media. Instructional media is one of the key determinants in influencing educational cost, it becomes imperative to investigate the impact of instructional media on students' academic achievement.

Table 2.2 below is the information on primary and secondary sectors of education's social and private returns to investment in education for Malawi (1982), Botswana (1983) and Zimbabwe's (1987).

Table 2.2: Primary and secondary social and private Returns

COUNTRY	**SECTOR**	**SOCIAL RETURNS%**	**PRIVATE RETURNS%**
BOTSWANA	**PRIMARY**	42.0	99.0
	SECONDARY	41.0	76.0
MALAWI	**PRIMARY**	14.7	15.7
	SECONDARY	51.2	16.8
ZIMBABWE	**PRIMARY**	11.2	16.6
	SECONDARY	47.6	48.5

Psacharopoulos and Patrinos (2002:18-19)

The data above shows that, the three countries selected in Sub Saharan Africa, testify that the Governments or states and their societies benefit more from primary and secondary education, unlike tertiary education, where there is huge funding. Botswana's

social returns from primary stands at 42.0 and that of her secondary sector stands at 41.0 compared to tertiary education sector at 15.0. Both the two sectors ;primary and secondary, are more than two and a half times what Botswana society gets from educating a primary and secondary individual in comparison to educating an individual at tertiary education, where the individual has more personal gains than the state. Malawi, the social returns on primary are at 14.7 and 51.2 for secondary sector respectively compared to 11.5 for tertiary education. In Zimbabwe, the primary social returns are at 11.2 and 47.6 for secondary sector respectively, compared to tertiary social returns at -4.3 point percentage.

Psacharopoulos (2005:8) further provides data to support the above assertion that higher education has more private benefits than social or public benefits. Of the 16 European countries surveyed, private returns to education is between 4.3 % to 26.5 %, and the average private returns is at 12.3 % point average. While the public returns is from 1.5 % to 16.0 %, and the average percentage point of 7.9. Psacharopoulos (2005), thus confirms that, the compilation depicted, the wider pattern observed and reinforces the difference between private and social returns, now at 4.4 percentage points on average. The difference between the private and social rates of returns is an indication of the degree of public subsidization of higher education. The data indicates that at tertiary education, the state or government or the society benefits less than the individual by at least on the percentage point average of 4.4. One of the main contributors of the tertiary cost of education is the material resources, thus in general instructional or teaching media, which takes the bulk of the teaching recurrent expenditure, besides the salaries and other institutional expenditure. At tertiary level, the learners are assumed to conceptualize the intended learning outcomes abstractly, (Piaget, Bruner, Dale, Bloom at cetera) without necessarily resorting to instructional media to aid their conceptualization of intended learning outcomes, and at tertiary level this is where governments, or society heavily subsidize the education, as opposed to primary or secondary education where instructional media is a necessity (Psacharopoulos and Patrinos 2002). At tertiary level of education, learners' cognitive styles, thinking styles and learning styles are clearly defined and observable. One can distinguish a convergent thinker from a divergent think, or a field dependent learner

form a field independent learner. In other words, it is possible to use instructional media in the teaching and learning process by observing the learner's needs. Those students who need instructional media (Piaget's concrete operational stage of cognitive development, Bruner's iconic mode, Dale's direct purposeful experience) and those who do not necessarily need instructional media , who can symbolically learn(Piaget's formal operational stage, Bruner's symbolic mode, Dale's abstraction stage).Now , if the community that has funded the tertiary education student , through tax and other contributions benefits less than the individual, that the society has educated, what is the point of heavily subsidizing the tertiary education as opposed to primary and secondary education, where society as a whole benefits more than the individual?

Psacharopoulos (2005:10) indicates that the private rate of return, which is the benefits accrued to the individual, is generally over time increasing, which may indicate that, the gap between social returns and private returns continue to widen. From 16 countries surveyed (Psacharopoulos 2005), only two countries have declining private rate of returns to investing in education, which is Ireland and Croatia. The remaining 14 countries show a steady rise in private rate of return to investment in education from 0.7 to 8.9 point percentage rise. This means that on the average, the private rate of return is rising by 3.22 % point.

Psacharopoulos and Patrinos (2002:13), show the returns to investment in education by level, full method, latest year, Regional averages, in percentages, as follows; Asia the primary social returns are at 16.2, secondary at 11.1, then followed by tertiary with 11.0 percentage points. Whereas in contrast to the primary private returns at 20.0, secondary at 15.8 and tertiary at 18.2 percentage points. This means that at tertiary education the individual gets back 18.2 % of the investment in education, whilst the society gets back 11.0 %, of on the same person of which the society has put more than the individual contribution to his/her own education. This is showing a difference of 7.2 %, if instructional media is one of the major contribution to the cost of education, it will make more sense to consider the use of instructional media at tertiary level of education, since andragogical assumptions, cognitive styles, thinking styles, learning styles, learning methods, all testify that, at tertiary level of education students can conceptualize the intended learning outcomes symbolically or abstractly. The region of

Europe, Middle east, North Africa, the primary social returns are at 15.6, secondary at 9.7 and tertiary with 9.9 percentage point, whereas in contrast to the primary private returns are at 13.85, secondary at 13.6% and tertiary with 18.8%. Comparing the social returns and private returns at tertiary level, the difference of 8.9 %, is a big difference, showing that private returns generally surpass the social returns which are supposed to help the society in general. A region of interest is Sub Saharan Africa, where Botswana is part, shows that the primary social returns are at 25.4 %, secondary at 18.4 %, and tertiary with 11.3 %, when these are compared to private returns, the primary is at 37.6 %, secondary at 24.6 % and finally tertiary with 27.8 %. A comparison of tertiary social returns versus private returns shows a difference of 16.5 %. This difference is great, showing that tertiary education in Sub Saharan region is more of a personal development rather than education for developing society. This means that, society in Sub Saharan region actually for the economic development of the countries is mainly from primary education at 25.4 %. Finally, the world summaries of returns to investment in education stand at these levels; the world primary social returns are at 18.9 %, secondary at 13.1 % and tertiary with 10.8 %, this is contrasted to the world primary private returns at 26.6 %, secondary at 17.0 % and finally tertiary with 19.0 %. The difference between tertiary education social returns and private returns are at 8.2 %.This now shows that the world over, the investment in education benefits the individual more than the society herself, who has educated the individual. The whole idea of comparing social returns to private returns is to try and identify the economic benefits of instructional media versus conceptualization of intended learning outcomes, as part of the fourth disputes identified by Clark(2001) as one of the major disputes about instructional media in American instructional media debate, and ultimately in this study.

The above data compared regional returns to investing in education, that is the social and the private rate of return. It also shows a comparative analysis of each category of education: primary, secondary and tertiary. The argument has been that private returns to investment in education are always higher in tertiary education when compared to primary and secondary education, whereas, primary and secondary sectors of education, have higher social benefits, when compared to tertiary education sector. The

idea is that, funding primary and secondary education are far much cheaper and beneficial, when compared to funding tertiary education sector. Ironically tertiary education does not benefit society, but the individual whom society has already paid for the costs of education. Instructional media is one of the major factors that affect cost of educating a learner, as suggested by Clark and Morrison (2002), that it appears that media can significantly influence the cost of learning and the ease of access to instruction by students. If instructional media has a significant influence on the cost of learning, and the same instructional media's effectiveness is debatable, there is a need to verify the benefits of instructional media. Moreover, tertiary students are assumed to be operating at formal operational or symbolic stage of cognitive development. Apart from this, they are assumed to be adults who can learn easily due to self-concept. Lastly, tertiary education has less social benefits in comparison to primary and secondary education. Tertiary education benefits tertiary learner at the expense of the very society that educates that learner. Looking at all this, is it necessary for the society to continue to invest in tertiary students 'instructional media? This is evidenced by that the social or public returns are higher for primary level than in secondary and tertiary levels of education, with the exception of OECD where the social returns of the primary sector are equal to tertiary education and lower than secondary education sector by 0.9 point percentage. (Psacharopoulos and Patrinos 2002:13).But, the global picture shows that, the World record on social returns in the primary sector of education is 18.9%, compared to secondary sector of education with 13.1% and tertiary education sector with 10.8% respectively. This shows that, when it comes to rate of return to investment in education, primary education has the highest returns followed by secondary education, then, lastly the tertiary sector of education. In other words, it is of good use to invest heavily where society benefits the most, than investing heavily in tertiary education, where the society gets back the least on their investment in education. Basically and generally, in all sectors of education, which is primary education, secondary education and tertiary education the private returns outweigh the social returns. This then, brings the argument that if society then gets less benefits than the individual, why should society continue to invest heavily in instructional media at tertiary level of education? From secondary level of education to tertiary level of education

students start to think symbolically and are able to grasp concepts abstractly. It becomes a waste on the part of society, when other sectors of economy such as health, infrastructure in dire need of that financial leverage. To sum up , these returns on investment in education, as the World Bank data shows that, at primary level, the social returns to education are the highest of 18.9, followed by secondary sector with 13.1 and lastly the tertiary education sector with 10.8 point percentage. When it comes to private returns, primary sector has the highest of 26.6, followed by tertiary sector of education with19.0 and lastly secondary sector with 17.0 points percentage.

Hall (2012), on the other hand uses monetary figures to show each private earnings of full time workers according to educational attainment, who were 25 years and older from United States Census Bureau (note that this information is originally in bar graph).This is an attempt to quantify the private returns to investment in education as envisaged by the number of years of schooling against one's life earnings (Hall 2012). Human capital add value to the worker as well as to the organization, therefore, this investment in human capital should yield positive return on investment (ROI), as any factor of production. Education is seen as a production function, which produces the needed human capital to drive the economy. Human capital is seen as the main driver of economic growth and productivity. Therefore, earnings by individual employees also play a crucial role as one of the indicators of economic and social development of the people in a country. Hall (2012) shows that private returns to education generally increase with educational attainment, from grade less than 9^{th} (all figures are before tax)earn US$16 000, from grade 9^{th}To grade 12^{th} US$20 000, high school graduate US$26 000, some college US$ 31 000, Associate degree US$ 33 000 , bachelors' degree US$46 000, Master's degree US$50 000, professional degree US$ 75 000 and a doctorate degree US$ 63 000, for example, the average Bachelor's degree holder earns nearly $20 000 more than a high school graduate. This is an indication that, the higher one goes in terms of educational attainment the more the private returns to education. The data above does not include the cost of education and other benefits of education. Suffice to say it is an attempt to quantify the private earnings, since literature has it that , when it comes to investment in education, there are more private returns, that is what accumulates to the individual, as opposed to social or public returns , that is

what accumulates to the society in general. The earnings rise according to qualification, with the exception of a professional degree at $ 75000, and even more than a doctorate degree by $12000.

2.10 CONCLUSION

The debate on the effectiveness of instructional media is still going on. Currently available literature supports the two schools of thought about the effectiveness of instructional media in the conceptualization of intended learning outcomes. It is necessary now to include other variables into this debate, that is the costs and benefits of instructional media, since the issue of efficiency comes in to play especially when the perceived results do not have significant differences. One has to realize that the use of instructional media or its effectiveness cannot be divorced from the cognitive styles, thinking styles, principles of learning, learning theories, content to be learnt, effective teaching and learning, and generally the availability of a good learning environment. When it comes to the benefits of learning especially economic as compared to social, literature has it that, tertiary education has more private benefits, that is what accrue to the individual , than public benefits , which accrue to the society as a whole. This is in comparison to primary and secondary education that does have more public than private benefits. In other words, society benefits more from a primary and secondary learner in comparison to a tertiary educated learner.

2.11 Summary- Chapter Two

This chapter focused on the debate between Clark/Kozma, resulting in the two schools of thoughts- the strong media effect school of thought and the weak media effect school of thought. It introduced theories of learning and their relationship to conceptualization of intended learning outcomes. It further introduces the instructional media usage models, the cognitive styles in relationship to conceptualization of intended learning outcomes, the principles of learning and finally analysis of debate on media's effectiveness in conceptualization of intended learning outcomes. The next chapter, Chapter three will look at the research design, research methodology, population, sampling, research instruments, data presentation and analysis, and finally, conclusions and recommendations.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

This study used the survey method. The aim of this study was to find out perceptions, usage and relevance of instructional media at tertiary level of education. Taking cues from Hofstee (2006), the survey method was considered appropriate to investigate the opinions or perceptions of tertiary educators on the impact of instructional media in the tertiary students' conceptualization of intended learning outcomes. Using Wimmer and Dominick's (2003) distinction between descriptive and analytical, this study applied both types of surveys. Therefore the study describes and explains the existing situation about instructional media. The survey method enabled examining and describing the effectiveness of instructional media in tertiary students' conceptualization of intended learning outcomes. It also helped in establishing the status of instructional media usage in tertiary and verifying if there is any correlation between instructional media and students' academic achievement section 1.6 (objectives of the study).Electronic and postage mail were used to distribute the study instruments. Mailing is relatively cheap given the geographical spread of the population .Mailing allowed a large amount of data to be obtained, although there was a low response rate.300 questionnaires were sent to tertiary institutions, and the response rate from tertiary educators was 183 questionnaires. The return rate for this study was 61%, above the threshold of 60% considered "Good" in a survey research according to Babbie (1997).

3. 1 Population

The population comprised of all tertiary institutions in Botswana registered and accredited by either Botswana training authority(BOTA) and or by Tertiary Education Council(TEC)These are regulatory bodies by Act of Parliament, BOTA, registers and accredits institution that offer programs up to certificate level at tertiary, it goes further to accredit Trainers and Assessors of different programs. By 2010, BOTA had registered 284 training institutions (10^{th} anniversary commemorative brochure page12) and TEC 36 institutions (TEC student directory 2011/2012:23). TEC, register and accredits institutions offering diploma to post graduate programs .The population frame

is composed of public, private, community owned, some by both government and private, some specializing in a certain program, and some offering variegated programs. The reason was to get a fair representation of all tertiary institutions in Botswana. The target respondents were the educators in these tertiary institutions and those who hold positions of responsibilities in the institutions.

3.2 Sampling

This study used probability sampling procedures, and this was done to increase the degree of representativeness and heterogeneity in the sample for generalization purposes, because, of the heterogeneity in the tertiary education sector, brought about by the following factors: ownership, entry points, programs offered. These especially ownership –private ownership affected sampling in that some institutions had no policy frame work on external researchers, hence needed approval from the board, as it was a precedent. Entry points for learners and programmes, had a bearing on the qualifications of the respondents, for example students having less than 36 points at form five level, may end up enrolling in certificate programmes and or diploma programs, that would rarely be taught by postgraduate lecturer, and this compromised the heterogeneity need for this study. This study then followed a probability sampling technique, the researcher called systematic stratified random sampling technique, which combined the systematic and stratified techniques, to create a true representativeness in the sample, as well as, catering for the heterogeneity stated above. The selection of this sampling procedure, was informed by the fact that, Botswana tertiary education sector, has strata that are discernable, that is, the tertiary education sector, can be divided into private, state and community owned institutions; it is also stratified into Universities, University Colleges, Colleges, institutes and Brigades. The colleges are further stratified into Colleges of education, institutes of health sciences, technical colleges, theological Colleges, colleges that offer variegated programmes and Brigades. This was the reason why systematic stratified random sampling technique was appropriate for this study, because each stratum formed a sampling frame, thus catering for the population parameters, as observed by Leedy and Ormrod (2010) that stratified random sampling has an advantage of guaranteeing equal representation of

each identified strata. In this case, each stratum was randomly selected using the systematic technique of selecting the nth in that particular sampling frame. Thus, finally producing a sample, that was a representative and catering for heterogeneity in the population frame, which can make the results of the sample, generalized to that particular population frame, in this case, the tertiary education sector of Botswana. With an expected sample of 30 institutions, constituting 10% of the population frame, each institution sampled, was required to distribute questionnaires to at least five to ten respondents holding different responsibilities, such as management positions and teaching positions. Thus, this gave out a total of a minimum of 300 questionnaires altogether of which a minimum of 100 questionnaires returned was considered to be sufficient for this study, following Babbie(1997)'s mark of 60% considered good.

3.3 Research Instruments

This study used a structured questionnaire. The questionnaire for this study had 22 question items, of which, seventeen question items were closed ended, meant to get information about the status quo of instructional media and students' academic achievement and these were structured for statistical purposes. The questionnaire also had five open ended questions, meant to elicit information why the respondent chose that particular response, and this helped to guard against unconscious selection of responses, and apart from this, it helped as a form of simple triangulation to get reliable response. It further validated the responses and gave some form of simple triangulation which is described by Ncube et al (2002) as an approach in which multiple sources of data, use of different investigators and research methodologies are combined in an attempt to look at the research problem from different angles. The questions on this questionnaire were arranged in the following order, for every at least three closed ended question an open ended question followed. This research instrument was appropriate not only considering the cost, but the geographical dispersion of the sampled institutions, and it became easier to send by post and reinforced by sending the same questionnaire electronically. This was done to improve the return rate of the questionnaires. The closed ended questions were formulated from the sub questions in order to statistically qualify the response on each sub problem, culminating to the

research question. The open ended questions, were important to verify the choice of response, although the analysis of data from open ended question was problematic, (Mhlanga and Ncube 2003, Hofstee 2006, Leedy and Ormrod 2010), but nevertheless, general thematic reasons appeared and these were categorized to find the reasons that were similar, since most of the open ended questions were about the respondents providing reasons for their chosen responses. This was done to make it be easier to tabulate related reasons. Another reason for using a questionnaire is that it provided a permanent verifiable record of data collected, which can be revisited; this was made possible since each questionnaire was given a number between 1 and 183, which were entered in the computer. The questionnaire had a section on biographical information of the respondents, which included: gender, age, education, position and experience. These biographical variables were important and appropriate to understand the demographics and psychographics of the respondents, firstly, in order to determine generally, whether the respondents are really the "actual" respondents which this study required. Then, secondly, to use the biographical variables as a reliability test; whether the variables influenced the perception (results of this study). The second part of the questionnaire dealt with institutional information: ownership, type by program, classification; university, university college, college etc. The third part was the questionnaire itself, composed of 22 questions. This questionnaire is attached *(see appendix 2 on page 239)*.

3.4 Data Collection Plan

The questionnaire was sent out with a return envelope stamped and already addressed to the researcher. The researcher visited the sampled institutions in his reach and personally delivered the questionnaires. The questionnaire that was sent electronically, in word format, the results were downloaded by the researcher, although most respondents did not favor the electronic format then, filed and analyzed with the other ones that were posted. The researcher, a total of 300 questionnaires was sent, of which more than a third was returned, and for this study it was considered good for confidence level. The data was collected from tertiary institutions *(see 3.3.1 population).*

3.5 Data Analysis Plan

The data collected, was analyzed using statistical procedures SSPS that produced frequency, percentages and valid percentages of each question item. This study combined the two, since it used qualitative design on the open ended questions to get the reasons and quantitative design on the closed ended questions, for statistical purposes, and this is what formed the bulk of the questions of this study. These questions were analyzed as per each objective and its two sub questions, which were formulated from the objectives. From the sub questions were questions under each sub question, when these questions were analyzed, automatically the sub questions were being analyzed. As the sub questions were analyzed, the objectives of the study were automatically being analyzed.

3 .6 Data presentation plan

The data was going to be presented in table and graphic forms, for comparison purposes. The following data was going to be presented: the demographics of the respondents, institutional information response rate, response on each sub question, responses from the questionnaire items, and finally a summation of the responses. The data shall be presented following the sequence of the sub problems borne out of the research objectives as observed by Ncube et al (2002), that data presentation follows the sequence and development of the sub problems. This suggestion goes well with concerns of this study, of which data can be put in to sets according to the research sub questions. In this study, the data is going to be presented following the six sub problems of this study, borne from research objectives *(see section 1.4 of this study).* Since the question items in the questionnaire have been formulated based on these research sub questions.

3. 7 Data analysis and discussion

The data is analyzed using statistical procedures on each sub question, such as descriptive statistics. The individual question items in the questionnaire will receive the same treatment, which is to discuss each objective and its corresponding sub questions. The response with the highest frequency is taken to be the view or

perception of the respondents regarding that particular question and subsequently the sub question and finally the objectives. The reasons that are advanced in support of responses, is the reason with the highest frequency, is taken to be representative of the views of the respondents , because these items on the questionnaire are borne from the sub questions, hence when analyzing the questions on the questionnaire , automatically you are building the analysis of the sub questions. When you analyze the research sub questions, you automatically answer the three research objectives, and ultimately the research question. The discussion will mainly focus on the pattern of the responses on closed ended questions and themes that emerge from open ended questions designed after closed ended questions to eliminate unconscious selection of responses provided. This is in agreement with Leedy and Ormrod (2010), who assert that, qualitative research design usually asks open ended questions. This study will follow themes and or patterns of the reasons when discussing the five open ended questions. These findings are then analyzed, and discussion will focus on each sub question and the meaning from the findings. The sub questions' findings will culminate to the research objectives and ultimately the discussion of the main research question, in order to answer, "What impact do instructional media have on the conceptualization of intended learning outcomes at tertiary level of education in Botswana?" or Do instructional media enhance tertiary students' conceptualization of intended learning outcomes in Botswana?

3.8 Ethical considerations

In this study, ethical issues were taken into consideration, in that, ethical clearance was sought from the Ministry of Education and Skills Development, Botswana. The clearance from the Ministry of Education and Skills Development was a research permit issued. The research permits, with application for permission to carry a study in Regions were presented to Regional Directors. Regional Directors issued letters to Heads of institutions. A letter seeking permission from Heads of institutions to distribute questionnaires, the Regional Director's letter and the research permit were handed to the Heads of institutions. The letters of permission from Heads of institutions, the letters from Regional Directors, the research permit from Ministry of Education and Skills

Development, an ethical clearance application and questionnaire were sent to the Ethics Committee at the University of South Africa for ethical clearance, which was granted. Permission granted, the respondents were given informed consent that stipulated their rights, issues of anonymity and confidentiality, of which they signed that they were voluntarily participating in the research having been informed. In short, the introductory letter and the questionnaire had clear stipulations on informed consent.

3.9 Conclusions and recommendations

The conclusions shall be drawn following each objective of the study, because each objective of study is married to the sub questions. The findings of the sub questions will be used to draw conclusions and recommendations, of each objective. The recommendations shall come from the findings and the conclusion that are drawn from this study.

3.10 Summary-Chapter Three

This chapter presented the research design, which is basically a mixture of quantitative and qualitative designs, the research methodology, which is descriptive and analytical survey, the population frame is composed of BOTA and TEC registered and accredited tertiary institutions only in Botswana, the sample is obtained through the systematic stratified random sampling technique, the research instrument, which is a questionnaire with 22 items; data collection plan, data analysis plan, and data presentation. This chapter also presented the data analysis and data discussion, ethical considerations and finally the conclusions and recommendations. The next chapter, which is chapter four, will present data analysis.

4. CHAPTER FOUR

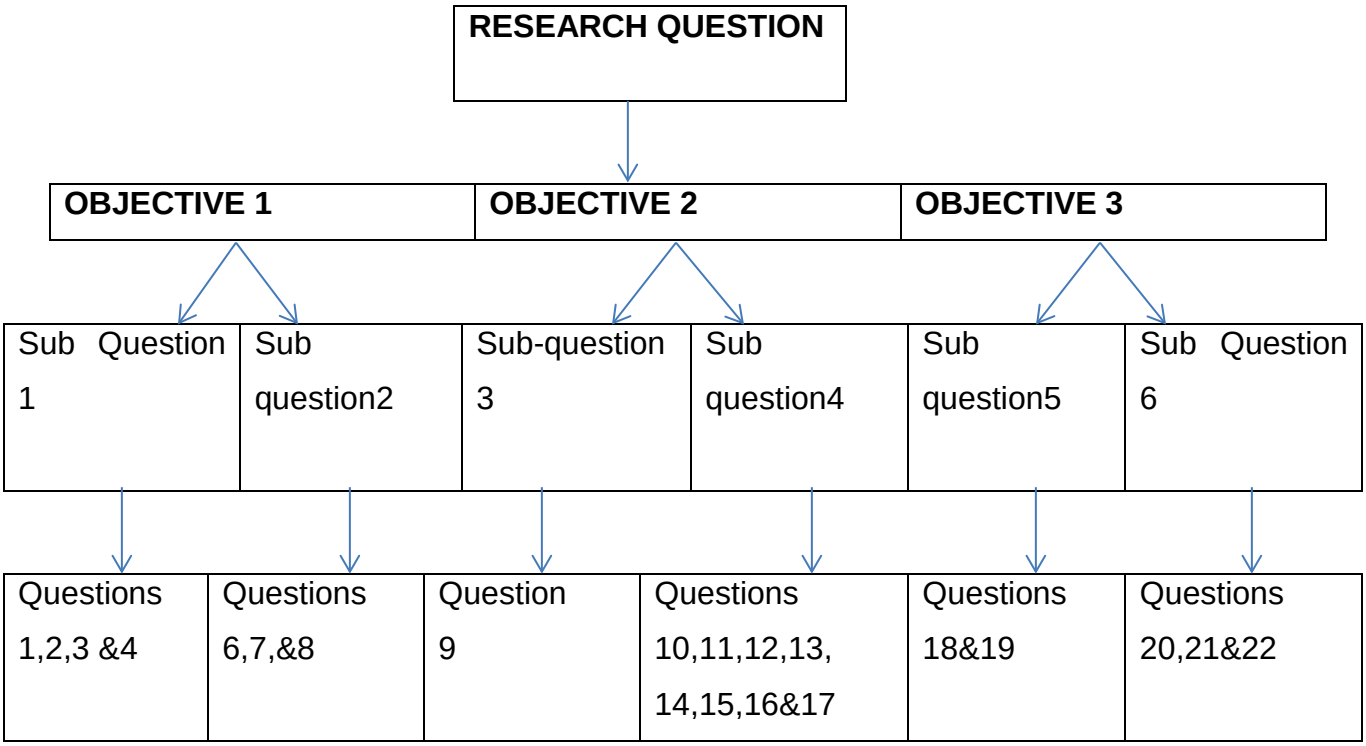
4.0 DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1 Introduction

This chapter presents theoretical and empirical findings; and discusses the findings from literature and 183 questionnaires completed by tertiary educators in Botswana. The purpose of this study was to identify the role of instructional media in tertiary students 'conceptualization of intended learning outcomes in Botswana. The results follow the same order in which the three objectives were stated. The objective had two sub questions which fall directly under it. Each sub question has a number of questions from questionnaire, which also directly fall under each sub question as they were stated on questionnaire following the order of the sub questions. The following data are presented; the biographical, institutional data and question items data. The results are summarized in tables and charts followed by analysis and critical discussion of the questionnaire results. The data on the tables show three sets of data: frequency, percent and valid percent. The frequency showed the possible number, of questionnaires return by the respondents. The percent indicate the total number of respondents including those who have not respondent to a question item. The valid percent is the percentage for only those who actually answered the question item(s). Analysis was done from both percent and valid percent; the **valid percent** was used for summary and conclusion. Construction of bar graphs and pie charts only the valid percent was used.

The data presentation and analysis for empirical findings are diagrammatically presented as follows:

Figure 4.1The Lampshade Model



The researcher used this model of presentation referred to as the Lampshade model, where the research question was divided in to three objectives. Each objective with two research sub questions under each , and finally the question items under each research sub question were discussed. The model above showed the presentation of the results, and the analysis of results. To analyze the research question, each objective was analyzed through the sub questions, and then the sub questions through question items on the questionnaire. Simply put, the research question was informed by the three objectives. The objectives were informed by sub questions (two sub questions per each objective), and finally each sub question was informed by the question items on the questionnaire, as it took a lampshade approach, from singular to multi plurals. This model was used to inform the development from research topic to research question, research objectives, and research sub questions to research question items on the questionnaire. This chapter ends with a brief summary.

4.2 The Aim of the study

The aim of this study was to find out what were the perceptions of educators in Botswana on the role; importance and use of instructional media at tertiary level of education in Botswana *(see section 1.5 for detailed aims of study)*

4.3 The objectives of this study

The objective of this study was to examine and describe the effectiveness of instructional media in the conceptualization of intended learning outcomes at tertiary level of education *(See section1.6 for objectives)*

4.4 Sub questions

The purpose of the sub questions was to break the research question in to manageable units for data collection, in order to answer the research question, and for this study, the sub questions *(see section 1.4 for details on sub questions)* which informed the construction of the research instrument (questionnaire)

4.5 Response Rate

300 questionnaires were sent to tertiary institutions, and the response rate from tertiary educators was 183 questionnaires. The return rate for this study was 61%, above the threshold of 60% considered “Good” according to Babbie (1997), when referring to return rate in a survey research.

4.6 The research instrument *(see section 3.3 for details)*

4.7 Demographics

4.7.1 Name(s) of respondents

The names of the respondents were optional for the sake of anonymity and confidentiality.

4.7.2 Sex (Gender) of respondents

This part of the questionnaire sought to find out the gender of the respondents who participated in this survey. The reasons were that; firstly the researcher felt gender might have a bearing on the respondents' perception of instructional media and students' academic achievement. Secondly gender was one of variables to be used as a simple check on the reliability of responses when it came to conclusion.

Table 4.1: Gender of Respondents

GENDER	FREQUENCY	PERCENT	VALID PERCENT
Male	101	55.2	62.3
Female	61	33.3	37.7
Total	162	88.5	100.0
Did not indicate gender	21	11.5	
Total	**183**	**100.0**	

The table on gender above indicates that 55.2% of the respondents were males, 33.3% females and 11.5 percent of respondents did not indicate their gender. However, of those who indicated their gender; 62, 3% of the respondents were males, and 37, 7% were females.

4.7.3 Ages of respondent

The researcher asked for the ages of respondents, because age is generally known to be one of the factors that influence greatly perception of individuals. The use of instructional media in teaching and learning, calls for preparation even outside working times, which might affect the leisure or social time of respondents. Age was to be used with other variables such as gender and qualifications in order to check for consistency in responses by respondents for reliability of the results.

Table 4.2 : Ages of Respondents

AGE RANGE	FREQUENCY	PERCENT	VALID PERCENT
25-30	29	15.8	16.6
31-40	83	45.4	47.4
41-50	49	26.8	28.0
51-65	14	7.7	8.0
Total	**175**	**95.6**	**100.0**
Did not indicate age	8	4.4	
TOTAL	**183**	**100.0**	

The table 4.2 indicates that 15.8% of returned questionnaires, the respondents were between 25-30 years old, 45.4% were between 31-40 years old, 26.8% were 41-50 years of age, 7.7% were 51-65 years old. The researcher did not ask for age beyond 65 years usually it is the official retirement age of workforce in Botswana generally. 4.4 % of all the respondents did not indicate their ages. However, for valid percent, 16.6% were 25 -30 years, 47.4% were 31-40 years, 28% were 41-50 years old and 8% were 51-65 years old. Therefore, the majority of respondents (47.4%) were between the ages of 31-40 years. In total 75.4% of the respondents were between the ages of 30 -50 years, which is a good age range for maturity purposes.

4.7.4 Highest qualification of respondents

This part sought information about the highest qualification(s) of the respondents in order to have an appreciation of the respondents 'educational background. Educational

background is a factor that might influence perception of respondents on the role of instructional media.

Table 4.3:Highest qualification of Respondents

HIGHEST QUALIFICATION(S)	FREQUENCY	PERCENT	VALIDPERCENT
Diploma	55	30.1	33.5
Higher /advanced diploma	30	16.4	18.3
Bachelor's degree	31	16.9	18.9
Honor's degree	17	9.3	10.4
Master's degree	30	16.4	18.3
Doctorate degree	1	.5	.6
Total	**164**	**89.6**	**100.0**
Did not indicate highest qualification	19	10.4	
GRAND TOTAL	183	100.0	

Of all returned questionnaires, 30.1% of the respondents held Diploma qualifications, 26.4% Higher or Advanced Diploma, 16.9% Bachelor's degree, 9.3% Honors' degree, 16.4% Masters' degree and 0.5% Doctoral degree. 10.4% of all returned questionnaires did not indicate their qualifications. The valid percent were 33.5% had Diploma, 18.3% Higher or Advanced Diploma, 18.9% Bachelor's degrees, 10.4% Honors degrees, 18.3% Master's degrees and 0.6% Doctoral degrees.

4.7.5 Years of experience of the respondents

This part of the questionnaire sought to find out how experienced were the respondents, in terms of years of teaching service in tertiary institutions in order to marry theory learnt about instructional media and practical experiences in classroom teaching and learning. This question also wanted to verify if the number of years of experience in teaching had a bearing on the increased or decreased use of instructional media. Finally, is the perception of respondents influenced by the number of years of experience in teaching, concerning the role of instructional media in conceptualization of intended learning outcomes.

Table 4.4: Years of experience of Respondents

YEARS OF EXPERIENCE	FREQUENCY	PERCENT	VALID PERCENT
1-5	49	26.8	28.3
6-10	41	22.4	23.7
11-20	60	32.8	34.7
21-30	18	9.8	10.4
31 and above	5	2.7	2.9
TOTAL	**173**	**94.5**	**100.0**
Did not indicate years of experience	10	5.5	
GRAND TOTAL	**183**	**100.0**	

Of all the 183 questionnaires returned, 26.8% of respondents were between 1-5 years of experience, 22.4% were 6-10 years of experience, 32.4% 11-20 years , 9.8% 21-30 years of experience and 2.7% were 31 and above years of teaching experience in tertiary institution. 5.5% of respondents did not indicate their years of experience. However, when considering the valid percentages of those who indicated their years of experience, 28.3% were 1-5 years of experience, 23.7% 6-10 years of experience, 34.7% between 11 and 20 years of experience, and 10.4% 21 -30 years of experience and 2.9% 31 and above years of experience in tertiary education. On the overall, the majority of respondents (34.7%) are between 11 and 20 years of teaching experience. This range in years of experience was good for this study, because it signaled seniority in education.

4.7.6 Position currently held by the respondents

This question sought to find out the position(s) of respondents in order to determine if positions of responsibility influenced the perception of respondents who participated in the survey. Different institutions used different nomenclatures for their positions as indicated below *(see table 4.5)*. It is worth to note that, different Institutions use the "titles" of positions for various purposes, and some may not carry the strict sense of everyday use of that title. A list of nomenclatures generally used in educational set up in Botswana was provided. The following table 4.5 presents the positions of respondents.

Table 4.5: Position currently held by Respondents

POSITION HELD		FREQUENCY	PERCENT	VALID PERCENT
	Principal	1	.5	.6
	Coordinator	4	2.2	2.2
	Pro vice chancellor	2	1.1	1.1
	Deputy principal	1	.5	.6
	Head/chair of department	17	9.3	9.4
	Associate professor	2	1.1	1.1
	Senior lecturer	39	21.3	21.5
	Lecturer	108	59.0	59.7
	Assistant lecturer	7	3.8	3.9
	TOTAL	**181**	**98.9**	**100.0**
Did not indicate	position	2	1.1	
GRAND TOTAL		**183**	**100.0**	

Of all the returned 183 questionnaires, 0.5% of respondents held the position of principal, 2.2% that of a coordinator,1.1% that of Pro vice chancellor, 0.5% that of Deputy Principal, 9.3% Head/Chair of a department, 1.1% Associate professor, 21.3% senior lecturers, 59% lecturers and 3.8% were assistant lecturers. 1.1% did not indicate their positions. However, the valid percentages of this question were 0.6% of the

respondents who indicated their positions were Principals, 1.1% were Pro vice Chancellor, 0.6 were Deputy Principals, 9.4% were Heads/Chair of departments, 1.1% were Associate Professor, 21.5% Senior lecturers, 59.7% were lecturers and 3.9% Assistant lecturers. Overall, 81.2% of respondents were lecturers and senior lecturers, and these were really classroom practitioners.

4.8 Institutional information

4.8.1 Ownership of Institution

This part sought to find out who owns the tertiary institution(s); individual, or organization or community or Government have impact on the availability of teaching resources, which might affect the perceptions of respondents. Botswana education system is made up of both public and private providers of tertiary education. The public institutions are purely owned by Government of Botswana, and they are funded from public purse.

Table 4.6: Ownership of institution

OWNERSHIP	FREQUENCY	PERCENT	VALID PERCENT
Community	5	2.7	3.4
Private	35	19.1	24.1
NGOs	2	1.1	1.4
Parastatal	5	2.7	3.4
TOTAL	**145**	**79.2**	**100.0**
NOT INDICATED	38	20.8	
GRAND TOTAL	183	100	

From 183 questionnaires returned, 2,7% of the respondents were from community owned, 19.1% were from private owned, 1.1% Non-Governmental Organization(NGOs), 2.7% were from parastatals, 53,6% were from public owned institutions. 20.8% of

respondents did not indicate the ownership of the institutions were they belonged. Considering the valid percentages, of those who actually indicated the type of ownership of institutions they belonged to, 3.4% were from community owned institutions, 24.1% from private, 1.4% from NGOs, 3.4% from Parastatals, and 67.6% from public institutions.

4.8.2 Category of institution

This part of the questionnaire sought to find out from which categories of the strata in the tertiary education system per se the respondents belong to, the reason being that each stratum offers a certain level of qualifications, for instance Brigades up to certificate level, colleges up to diploma level and so on. It sought out where the respondents were actually teaching in terms of the Botswana tertiary education system's stratification. The category of institution has a bearing on the qualification of respondents, the programs respondents teach for example brigades concentrate on vocational programs such bricklaying, welding, mechanics, carpentry at certificate level to mention a few. Category of institution due to the nature of programs might have had an influence on the respondents' concerning instructional media.

Table 4.7 Category of Institution

CATEGORY	FREQUENCY	PERCENT	VALID PERCENT
Brigade	103	56.3	60.6
College	58	31.7	34.1
University college	6	3.3	3.5
University	3	1.6	1.8
TOTAL	**170**	**92.9**	**100.0**
CATEGORY NOTINDICATED	13	7.1	
GRAND TOTAL	**183**	**100.0**	

From 183 questionnaires returned, 56.3% of respondents were at Brigades, 31.7% were at Colleges, 3.3% University Colleges and 1.6% were at University. 7.1% did not indicate from which tertiary strata they belong to. Looking at the valid percentages, those who actually indicated their stratum which they belonged to were, 60.6% from brigades, 43.1% from colleges, 3.5% from University Colleges, and 1.8% from Universities.

4.8.3 Specialization of Institution

The question sought to find out it terms of academic programmes, what type of educational curriculum respondents are exposed to in their institutions where they belonged to, since the type of curriculum might have a bearing on the way instructional

media is utilized in the programme specializations. This might influence the perception of the respondents.

Table 4.8: Institutional Specialization domain

INSTITUTIONAL SPECIALIZATION	FREQUENCY	PERCENT	VALID PERCENT
Education	43	23.5	25.7
Health	3	1.6	1.8
Engineering	20	10.9	12.0
Religious	2	1.1	1.2
Vocational	84	45.9	50.3
Mixed	4	2.2	2.4
Business	11	6.0	6.6
TOTAL	**167**	**91.3**	**100.0**
Did not respond	16	8.7	

Of the total 183 returned questionnaires, 23.5% of respondents were from education, 1.6% from health, 10.9% from Engineering, 1.1% from religious institutions, 45.9% from vocational, 2.2% from mixed and 6% from business related specializations. 8.7% did not indicate the specializations of their institutions. However, **the valid percentages**, those who actually indicated their institutional specializations; 25.7% of respondents, were from education, 1.8% were from health, 12% were from engineering, 1.2% were from religious institutions, 50.3% were from vocational specializing institutions, 2.4% were from mixed curriculum and 6.6% from institutions specializing in Business related programmes.

4.8.4 Type of institution

This part sought to find out the type of institutions the respondents belonged to in order to have an appreciation of conditions of service, which might have influence on the perception of instructional media by respondents. The type of institution has to some extent a bearing on the issue of resources-instructional media in the teaching and learning process.

Table 4.9:Type of institution

TYPE OF INSTITUTION	FREQUENCY	PERCENT	VALID PERCENT
Private	40	21.9	22.5
Government	133	72.7	74.7
Parastatal	5	2.7	2.8
TOTAL	**178**	**97.3**	**100.0**
type of institution not identified	5	2.7	
GRAND TOTAL	**183**	**100**	

From 183 questionnaires returned, 21.9% were from private tertiary institutions, 72.7% from Government institutions, and 2.7% from parastatals. 2.7% did not indicate their type of institutions. However, the **valid percentages** of the respondents who actually indicated their types of institutions were, 22.5% were from private institutions, 74.7% from Government institutions, and 2.8% from parastatals.

4.9 Findings from closed-ended questionnaire items

The development of the questionnaire followed a lampshade model *(see figure 4.1).*Therefore for data presentation and analysis, the objective is presented, then

followed by the sub questions under it, and then the questions that fall under each sub research question. The following is objective by objective presentation of findings.

4.9.1 Objective one

Objective one of the study was to examine and describe the effectiveness of instructional media in the conceptualization of intended learning outcomes at tertiary level. In order to meet this objective, the research sub question was phrased: What are the views of tertiary educators concerning the necessity and relevance of using instructional media at tertiary level of education? Respondents were asked a number of questions.

The first question was: Do you use instructional media in the teaching and learning process at tertiary level of education? This question sought to find out how many of the respondents used instructional media in their institutions during teaching and learning process. The following table 4.10 is of responses and the analysis that follows.

Table 4.10: Use of instructional media in teaching and learning

RESPONSE TO USE OF INSTRUCTIONAL MEDIA	FREQUENCY	PERCENT	VALID PERCENT
Yes	131	71.6	73.6
No	47	25.7	26.4
TOTAL	**178**	**97.3**	**100.0**
Did Not Indicate Use	5	2.7	
GRAND TOTAL	**183**	**100.0**	

Table 4.10 showed that 71.6% of the respondents who returned their questionnaires said “Yes” they used instructional media during teaching and learning process in their institutions, 25.7% said “No”, and they did not use instructional media in their institutions during teaching and learning process. 2.7% did not indicate whether they used

instructional media or not during teaching and learning process. The valid percentages were 73.6% of respondents said “Yes” they used instructional media, 26.4% said “No” they did not use instructional media. In this case instructional media was mostly used by respondents in their respective institutions, and it may be concluded that instructional media was used in tertiary students’ conceptualization of intended learning outcomes in Botswana.

The second question was: What is your opinion about the necessity to use instructional media in tertiary students’ conceptualization of intended learning outcomes? This question sought to find out the opinion of respondents on whether instructional media were necessary to use when it came to the tertiary students’ conceptualization of intended learning outcomes. The following table 4.11 presents the opinions of respondents on the necessity to use instructional media.

Table 4.11: Respondents’ opinion on necessity to use instructional media

RESPONSE TO THE USE OF INSTRUCTIONAL MEDIA	FREQUENCY	PERCENT	VALID PERCENT
Very necessary	117	63.9	64.3
Necessary	60	32.8	33.0
No opinion	4	2.2	2.2
Unnecessary	1	.5	.5
TOTAL	**182**	**99.5**	**100.0**
Did not respond	1	.5	
GRAND TOTAL	**183**	**100.0**	

The following are the responses from table 4.11 above: 63.9% of respondents said instructional media were very necessary in the conceptualization of intended learning outcomes. 32.8% said instructional media were necessary. This means that 96.7% of the respondents agreed that instructional media were a necessity in the conceptualization of intended learning outcomes. 2.2% had no opinion, 0.5% indicated unnecessary and 0.5% did not indicate their opinion. However, the valid percentages were 64.3% said instructional media was very necessary in the conceptualization of intended learning outcomes. 33% said instructional media were necessary, thus 97.3%

of valid percentage agreed that instructional media were a necessity in conceptualization of intended learning outcomes at tertiary level of education. 2.2% had no opinion. 0.5% indicated unnecessary. Therefore, it could be concluded that respondents found instructional media were a necessity in tertiary students' conceptualization of intended learning outcomes in Botswana.

The third question that was asked respondents was: instructional media is relevant in the teaching and learning process at tertiary level of education. Do you agree or disagree? This question sought to find out whether respondents' found instructional media relevant in their teaching and learning process at tertiary level of education. The following Table 4.12 presents how the respondents reacted to the above question.

Table 4.12: Relevance of instructional media at tertiary education

RESPONSES	Frequency	Percent	Valid Percent
Strongly agree	107	58.5	58.8
Agree	73	39.9	40.1
Disagree	1	.5	.5
Strongly disagree	1	.5	.5
Total	**182**	**99.5**	**100.0**
Did not indicate "agree or disagree"	1	.5	
GRAND TOTAL	**183**	**100.0**	

The researcher found out that 58.5% of the respondents **strongly agreed** that instructional media were relevant in the teaching and learning process at tertiary level of education in Botswana. 39.9% **agreed** that instructional media were relevant. 0.5% **disagreed,** that is instructional media were relevant in the teaching and learning process at tertiary education. 0.5% strongly disagreed, that is instructional media were relevant in the teaching and learning at tertiary education level in Botswana. The valid percentages were 58.8% **strongly agreed** that instructional media was relevant in the

teaching and learning at tertiary level of education.40.1% **agreed** that instructional media were relevant in the teaching and learning at tertiary level of education in Botswana. In summary**,** 98.9% of respondents in Botswana agreed to fact that instructional media were relevant in the teaching and learning at tertiary level of education in Botswana, against 1.1% of the tertiary educators in Botswana who disagreed that instructional media were relevant in the teaching and learning at tertiary level in Botswana.

The researcher then concluded that since 98.9% of respondents in Botswana agreed to strongly agreed, it was concluded that instructional media were relevant in the teaching and learning at tertiary level of education in Botswana.

The last question asked respondents under the first sub question was question four, and this was what question four required them to do: Give reason(s) for your choice of responses in questions 2&3 above. Basically, question four required that respondents authenticated their responses for question**(2),** which required respondents to give their own opinion on the necessity of using instructional media and also question**(3),** which required respondents to agree or disagree on the relevance of instructional media in the teaching and learning at tertiary level of education in Botswana. In this question four, respondents were to give reasons to support their choices of responses. The following table 4.13 provides summarized reasons given by respondents.

Table 4.13: Reasons for Respondents' responses in questions 2 and 3

REASON(S)	FREQUENCY	PERCENT	VALID PERCENT
Effective teaching	86	46.9	58.9
Research for students become easier	4	2.2	2.7
Learning made easier	49	26.7	33.5
Technology is advancing	5	2.7	3.4
Improve education for special need students	2	1.1	1.3
TOTAL	**146**	**79.8**	**100**
Not Answered/Specified Reasons	37	20.2	
GRAND TOTAL	**183**	**100**	

Of the total 183 respondents, 46.9% said instructional media were necessary in the conceptualization of intended learning outcomes and relevant in teaching and learning at tertiary education, because instructional media **enhanced effective teaching and effective learning.** 2.2% said instructional media were necessary and relevant at tertiary level of education, because instructional media made **students' researching easier**. 26.7% of the respondents said instructional media were necessary and relevant because, **learning was made easier**. Then 2.7% said instructional media were necessary and relevant because **technology was advancing,** meaning eventually e-learning would be part and parcel of teaching, therefore, instructional media was a way of keeping abreast with technological changes in education. Finally 1.1% of the respondents said instructional media **improved education for special need students**. 20.2% of the respondents did not give their reasons for choice of responses in questions **(2)** and **(3)**.When looking at the valid percentages, a total of 96.7% of respondents said instructional media were necessary in the conceptualization of intended learning outcomes and relevant in the teaching and learning at tertiary level of education in Botswana because, instructional media enhanced effective teaching and made learning easier**.** The researcher, therefore, concluded that, the reasons why 96.7% of respondents said instructional media were necessary in the conceptualization of intended learning outcomes and relevant in the teaching and learning at tertiary level

of education in Botswana. 98.9% of respondents in Botswana agreed to fact that instructional media were relevant in the teaching and learning at tertiary level of education were that 92.4% believed that instructional media enhanced effective teaching and learning easier.

A second sub question was phrased in order to fully address the concerns of objective one as follows: What are the perceptions of educators about the extent and frequency of utilizing instructional media at tertiary level of education? This sub question required respondents to give the extent and frequency of instructional media usage, in tertiary students' conceptualization of intended learning outcomes. To answer this sub question, a number of questions were formulated, from question 5 to question 8 of the questionnaire.

Question 5 was presented as follows: To what extent do you use instructional media during the teaching and learning process, in your institution?

This question required respondents to indicate the degree or level of instructional media usage in the teaching and learning process in the respondents' respective institutions. The respondents provided the following information in Table 4.14

Table 4.14: To what extent do Respondents used instructional media

EXTENT OF INSTRUCTIONAL MEDIA USE	FREQUENCY	PERCENT	VALID PERCENT
Greater extent	52	28.4	29.4
Lesser extent	56	30.6	31.6
Not sure	11	6.0	6.2
Not often	33	18.0	18.6
Rarely	25	13.7	14.1
Total	**177**	**96.7**	**100.0**
Did not indicate extent of instructional media use	6	3.3	
Total	**183**	**100.0**	

Out of the 183 respondents, 28.4% said they used instructional media during teaching and learning process in their institutions to a **greater extent**. 30.6% said they used instructional media during teaching and learning in their institutions to a **lesser extent.**

6% were not sure. 18% of the respondents said that they used **not often** instructional media during teaching and learning in their institutions. 13.7% of the respondents said they used **rarely** instructional media during teaching and learning in their institutions.

However, looking at the valid percentages, 61% of respondents in Botswana said they used instructional media during teaching and learning process from **lesser extent** to **greater extent** in their institutions. 6.2% were not sure, and 32.7% of respondents said they do **not often** use instructional media during teaching and learning process in their institutions. Therefore, in summary, 61% of respondents in Botswana used instructional media during teaching and learning process from **lesser extent** to **greater extent** against 32.7% of Botswana tertiary educators who **rarely** to **not often** used instructional media during teaching and learning process, the researcher concluded that instructional media is used during teaching and learning process in Botswana from **lesser extent** to **greater extent.**

Question Six (6), was fashioned as follows: How often do you use instructional media during the actual teaching and learning process? The purpose of this question required that the respondents give qualitatively their individual frequencies of using instructional media in the **actual** teaching and learning process in their lessons/lectures, as qualifying the extent (*see question five 5 above).* The following table 4.15 presents the actual use of instructional media by respondents in teaching and learning process at tertiary education in their institutions.

Table 4.15: How often do respondents use instructional media?

HOW OFTEN THEY USED INSTRUCTIONAL MEDIA	FREQUENCY	PERCENT	VALID PERCENT
Always	25	13.7	14.4
Very often	41	22.4	23.6
Not sure	8	4.4	4.6
Sometimes	76	41.5	43.7
Seldom	24	13.1	13.8
TOTAL	**174**	**95.1**	**100.0**
did not indicate how often they use instructional media	9	4.9	
GRAND TOTAL	**183**	**100.0**	

The table 4.15 above showed that 13.7% of the respondents used instructional media **always** during their lectures. 22.4% of the respondents used instructional media during their teaching and learning **very often.** 4.4% of the respondents were not sure. 41.5% of respondents used instructional media in the actual teaching **sometimes.** 13.1% seldom used instructional media during actual teaching and learning.

The valid percentages indicated that 38% of tertiary educators in Botswana actually used instructional media in their lectures **very often** to **always,** during teaching and learning process in their lessons.4.6% were not sure. 43.7% of the respondents used **sometimes** instructional media during the actual teaching and learning process in their lessons. 13.8% **seldom** used instructional media during the actual teaching and learning process in their lessons.

81.7% of tertiary educators in Botswana used instructional media during the actual teaching and learning process from **sometimes**, to **very often** and **always.**

13.8% **seldom** used instructional media during the actual teaching and learning process. Therefore the researcher finally made the following conclusion; that since 81.7% of respondents in Botswana used instructional media during the actual teaching and learning process against 13.8% of respondents who **seldom** used instructional media; instructional media was used sometimes to always by respondents in tertiary students' conceptualization of intended learning outcomes.

Question Seven (7) was also phrased as a follow up to question six above. This was how question seven was crafted: From your response in question 6 above, how many times do you actually use instructional media during teaching and learning process?

This question sought to find out the quantitative or actual number(s) the respondents utilized instructional media during the teaching and learning process. The following Table 4.16 presents the actual use of instructional media.

Table 4.16: How many times respondents actually used instructional media?

TIMES DO YOU ACTUALLY USE INSTRUCTIONAL MEDIA	FREQUENCY	PERCENT	VALID PERCENT
Every lecture	25	13.7	15.6
Once/twice a week	23	12.6	14.4
When appropriate	90	49.2	56.3
Once/ twice a fortnight	5	2.7	3.1
Once/twice a month	17	9.3	10.6
TOTAL	**160**	**87.4**	**100.0**
Did not indicate how many times.	23	12.6	
GRAND TOTAL	**183**	**100.0**	

Of the total 183 respondents, 13, 7% indicated they used instructional media in **every lecture.** 12.6% used instructional media **once or twice a week.** 49.2% used instructional media during teaching and learning when **appropriate.** 2.7% used instructional media during teaching and learning **once or twice a fortnight.** 9.3% used instructional media during teaching and learning **once or twice a month.**12.6% of the respondents did not indicate times they actually used instructional media during teaching and learning process.

Valid percentages indicated that 30% of respondents use instructional media **every lecture** to **once /twice a week.** 56.4% of respondents use instructional media **when appropriate.** 13.7% of the respondents use instructional media **once/twice a fortnight** to **once/twice a month.** In summary, 43.7% of the respondents used instructional media every lecture to once/twice a month, and 56.4% of respondents

used instructional media when appropriate, in tertiary students' conceptualization of intended learning outcomes during teaching and learning process. The researcher, then concluded that instructional media was used by 100% of respondents between every lecture and to when was appropriate.

The next question was question eight **(**8**)**, presented by the researcher as follows: Give reason(s) for the responses given in questions 5, 6 & 7. This question required that the respondents give reasons for their chosen responses to question **(5)** "what extent do you use instructional media during the teaching and learning process, in your institution?" Question **(6)** "How often do you use instructional media during the actual teaching and learning process?" and question **(7)**"From your response in question 6 above, how many times do you actually use instructional media during teaching and learning process?" Table 4.17 presents the reasons given by respondents for their responses to questions 5, 6 & 7 below.

Table 4.17: Respondents reason(s) for responses in questions 5, 6 & 7

REASON(S) FOR TO WHAT EXTENT, HOW OFTEN, HOW MANY TIMES THEY USE INSTRUCTIONAL MEDIA DURING TEACHING &LEARNING PROCESS.	**FREQUENCY**	**PERCENT**	**VALID PERCENT**
Effective teaching/ making understanding better/ make easier communication	36	19.7	29.3
No resources	61	33.3	49.6
Depends on objective, topic, accessibility of resources	18	9.8	14.6
Students do not require instructional media	8	4.4	6.5
TOTAL	**123**	**67.2**	**100**
Did not indicate the reason(s)	60	32.8	
GRAND TOTAL	**183**	**100**	

The table 4.17 showed 19.7% of the respondents indicated that the extent they used media, how often they used media and the number of times they actually used media in the teaching and learning process, the reasons were **effective teaching and making better understanding of the concepts and easier communication with the learners.** 33.3% of the respondents indicated that the extent they used media, how often they used media and the number of times they actually used media in the teaching and learning process, the reason for their chosen responses was **lack of resources** in their institutions. 9.8% of the respondents showed that the extent they used media, how often they used media and the number of times they actually used media in the teaching and learning process, the reasons were that; the use of instructional media in the teaching and learning process **depended on the objectives, topic, and or accessibility to resources.** 4.4% of the respondents indicated the extent they used media, how often they used media and the number of times they actually used media in the teaching and learning process, the reason was that **student do not require instructional media.** 32.8% of the respondents did not indicate reasons.

Of the valid percentage, 29.3% of the respondents indicated that the extent they used media, how often they used media and the number of times they actually used media in the teaching and learning process, the reasons were **effective teaching and making understanding of the concepts better.** 49.6% of the respondents indicated that the reason for their chosen responses was **lack of resources** in their institutions. 14.6% of the respondents showed that the reasons were the use of instructional in the teaching and learning process **depended on the objectives, topic, and or accessibility to resources.** 6.5% of the respondents indicated the reason was **student do not require instructional media.**

In summary, 49.6% of the respondents indicated that the reason was **lack of resources** in their institutions.29.3% of the respondents indicated that the reasons were **effective teaching and making understanding of the concepts better.** 6.5% % of the respondents indicated their reason was **student do not require instructional media.** It was then concluded by the researcher that the extent and frequency of using instructional media in tertiary students' conceptualization of intended learning outcomes in Botswana were influenced by the following factors: lack of resources (49.6%),

effective teaching and making concepts understood better (29.3%) and those tertiary students do to require instructional media (6.5%). Although respondents tried to use instructional media because they understood that instructional media influenced effective teaching and made concepts understood better by tertiary students, they faced a challenge of lack of adequate resources for teaching purposes.

4.9.2 Objective Two (2)

Objective two of this study was to justify and verify, if there was a correlation between instructional media and students' academic achievement, at tertiary level of education. This objective sought to find out if some relationship existed between instructional media and tertiary students' academic achievement. In order to meet this objective, the research sub question three was phrased as follows: What are the other benefits of using instructional media during the teaching and learning process, other than the currently debated "conceptualization effect" at tertiary level of education? This sub question required respondents to give the other benefits they derived in using instructional media during the teaching and learning process in their respective institutions.

Respondents were given question 9 as to facilitate response to sub question three as follows: There are some benefits other than academic achievement associated with the use of instructional media in the teaching and learning process. Do you agree or disagree? This question asked whether respondents realized or experienced other benefits associated with the use of instructional media during the teaching and learning process other than the academic achievement of the learners. The following were the response to question 9 on Table 4.18

Table 4.18: Other benefits of instructional media

RESPONSES TO INSTRUCTIONAL MEDIA BENEFITS	FREQUENCY	PERCENT	VALID PERCENT
Strongly agree	70	38.3	39.3
Agree	88	48.1	49.4
Not sure	12	6.6	6.7
Disagree	4	2.2	2.2
Strongly disagree	4	2.2	2.2
TOTAL	**178**	**97.3**	**100.0**
Did not indicate	5	2.7	
GRAND TOTAL	**183**	**100**	

Table 4.18 shows that 38.3% strongly agreed that there were other benefits.48.1% of the respondents agreed that there were other benefits of using instructional media in the conceptualization of intended learning outcomes at tertiary level. 6.6% were not sure whether they were other benefits of using instructional media at tertiary level of education. 2.2 % disagreed that they were other benefits besides the “conceptualization effect” and 2.2 % of respondents strongly disagreed that they were other benefits of using instructional media at tertiary level. Therefore, 86.4% of respondents agree to strongly that there were other benefits of using instructional media at tertiary level of education. On valid percentages see figure 4.1 below.

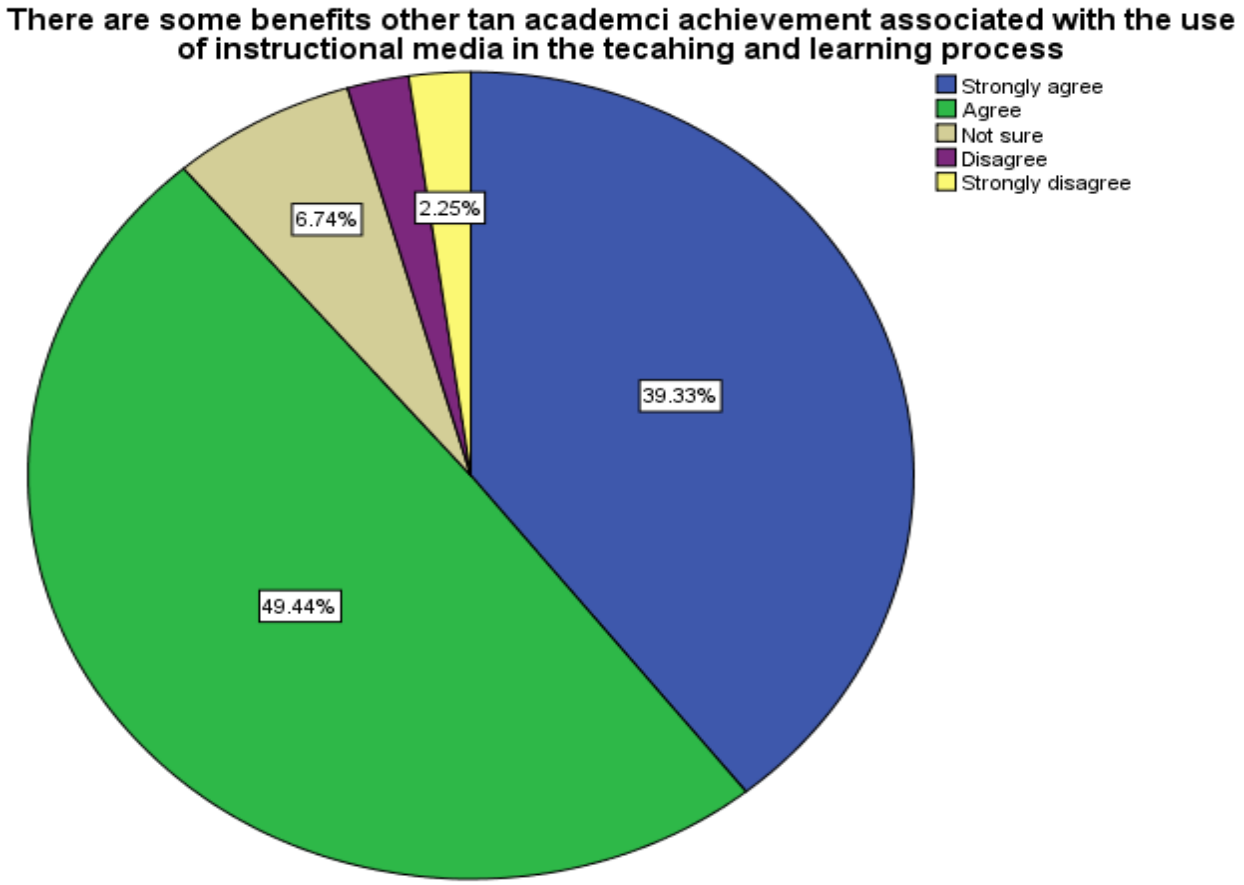


Figure 4.2: Other benefits of Instructional media

Figure 4.2 shows 39.3% of the respondents **strongly agreed** there were some benefits of using instructional media in the teaching and learning process other than the academic achievement of the learners. 49.4% of the respondents **agreed** that there were some benefits of using instructional media in the teaching and learning process other than the academic achievement of the learners. 6.6% were **not sure**. 2.2% of the respondents. 2.2%of the respondents **strongly disagreed** that there were some benefits of using instructional media in the teaching and learning process other than the academic achievement of the learners. 2.7% of the respondents did not indicate a response.

Therefore figure 4.1 indicates 88.7% of respondents **agree** to **strongly agree** that there were some benefits of using instructional media in the teaching and learning process other than the academic achievement of the learners. 6.7% of the respondents were **not sure** that there were some benefits of using instructional media in the

teaching and learning process other than the academic achievement of the learners. 4.4% of the respondents in tertiary education sector of Botswana **disagree** to **strongly disagree** that there were some benefits of using instructional media in the teaching and learning process other than the academic achievement of the learners.

The researcher concluded that 88.7% of respondents in Botswana agree to **strongly agree** that there were some other benefits of using instructional media in the teaching and learning process as opposed to 4.4% of the respondents' who **disagree** to **strongly disagree** that there were some other benefits of using instructional media in the teaching and learning process. Therefore, instructional media brought other benefits in the tertiary students' conceptualization of intended learning outcomes in Botswana.

Yet in order to address fully objective two, another sub question four (4) was presented: What is the relationship between instructional media and students' academic achievement? This sub question sought respondents to express the type of relationship between instructional media and tertiary students' conceptualization of intended learning outcomes. This sub question was the core of this study as it tried to find out the relationship between instructional media and tertiary students' conceptualization. A couple of questions were developed as indicated; questions 10, 11, 12, 13, 14, 15, 16, and 17, were asked the respondents in order to address stated objective.

Question ten (10) was expressed as: In your own opinion is there any difference in academic performance among students taught using instructional media from those taught using traditional ways? Table 4.19 shows the responses given out by respondents.

Table 4.19: Opinion on difference(s) in academic performance

OPINION	FREQUENCY	PERCENT	VALID PERCENT
There is a difference	145	79.2	81.0
No opinion	23	12.6	12.8
Did not indicate a response	4	2.2	2.23
There is no difference	11	6.0	6.1
TOTAL	**179**	**97.8**	**100.0**
GRAND TOTAL	**183**	**100.0**	

The table 4.19 above shows that 79.1% of the respondents said there were differences in academic performance among students taught using instructional media from those taught using the traditional ways. 12.6% had no opinion. 2.2% of the respondents did not indicate their own opinion. 6% of the respondents indicated there were no differences in academic performance among students taught using instructional media from those taught using the traditional ways.

The valid percentages- figure 4.3 below shows that: 81% of the respondents' said there were differences in academic performance among students taught using instructional media from those taught using the traditional ways. 12.8% of the respondents had no opinion 2.23 % of the respondents did not indicate their own opinion. 6.1% of the respondents indicated there were no differences in academic performance among students taught using instructional media from those taught using the traditional ways.

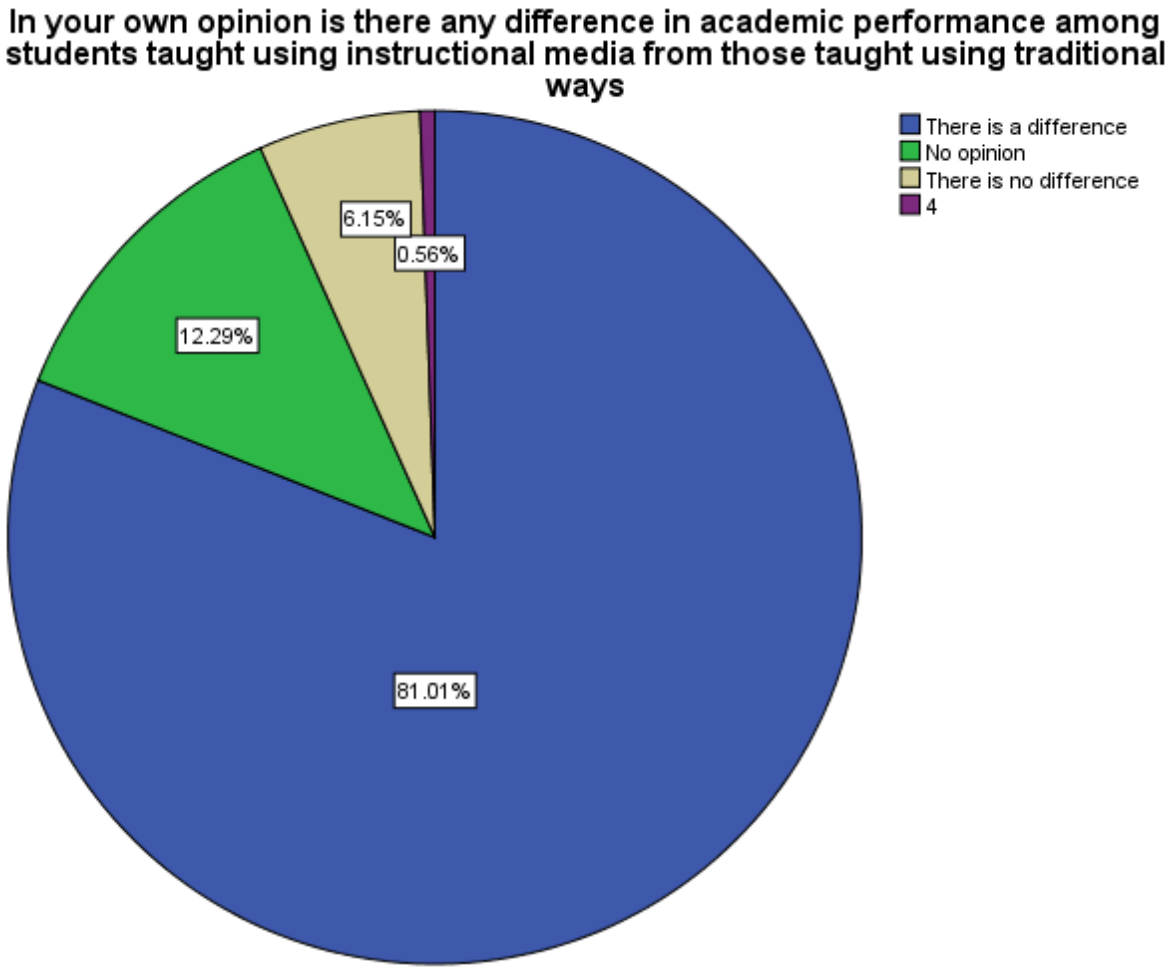


Figure 4.3: Opinion of differences in academic performance

In summary, the general view (81%) of respondents in Botswana was that: there were some difference in tertiary students' conceptualization of intended learning outcomes among students taught using instructional media from those taught using the traditional ways, against 6.1% of the respondents who said there were no differences in academic performance among students taught using instructional media from those taught using the traditional ways. Therefore, the researcher then concluded that the overall view of the respondents in Botswana was that there was a difference in academic performance between tertiary students who are taught using instructional media versus tertiary students who are taught using traditional ways of instruction.

Question eleven (11) was a follow up to question ten and it was crafted as follows for the respondents: Select a comment for your response in question 10 above. Question eleven required respondents to justify their responses in question **(10)** above.

Table 4.20: Respondents' comment for their response in question 10 above

PERFORMANCE	FREQUENCY	PERCENT	VALID PERCENT
Students who are taught using instructional media perform better academically	123	67.2	70.7
Students who are taught using traditional ways perform better academically	6	3.3	3.4
No comment on the two systems of teaching above	32	17.5	18.4
The students generally perform the same academically	13	7.1	7.5
Total	**174**	**95.1**	**100.0**
Did not provide any comment	9	4.9	
Total	**183**	**100.0**	

The following were the comments from 183 respondents in table 4.20 above; 67.2% of the respondents commented that "Students who are taught using instructional media perform better academically." 3.3% of the respondents commented that **"**Students who are taught using traditional ways perform better academically**."** 17.5% had "no comment of the two systems of teaching above." 7.1% of the respondents commented, "The students generally perform the same academically**."** 4.9% of respondents did not provide any comment. On valid percentages, figure 4.4 below summarizes the responses.

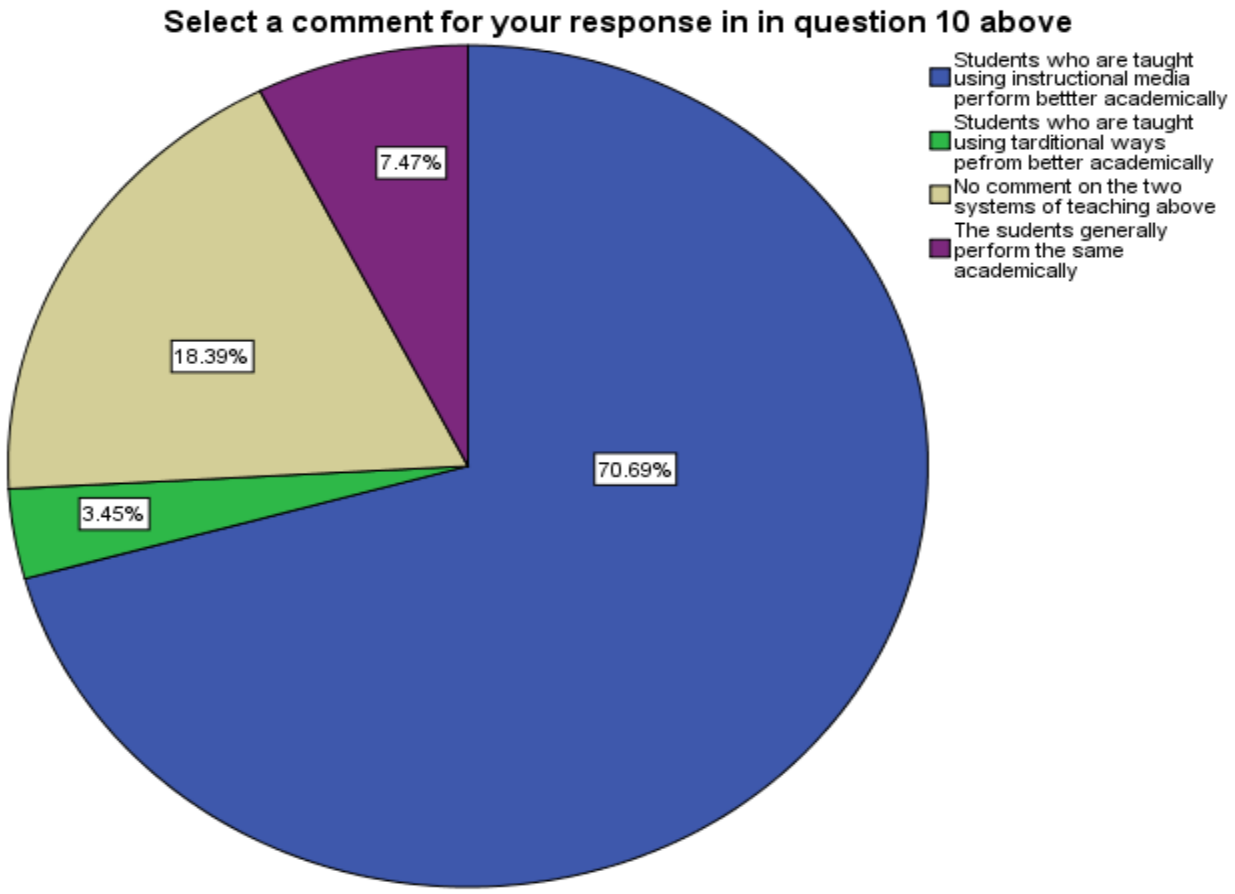


Figure 4.4: Respondents' comments on their responses in question 10

Figure 4.4 above shows, tertiary education respondents in Botswana commented as follows: 70.7% of the tertiary educators commented that "Students who are taught using instructional media perform better academically." 3.4% of the respondents commented that **"**Students who are taught using traditional ways perform better academically**."** 18.4% of the respondents had "no comment of the two systems of teaching above." 7.5% of the respondents in Botswana commented, "The students generally perform the same academically**."**

The researcher then concluded that the general view of respondents in Botswana was that instructional media enhance tertiary students' conceptualization of intended learning outcomes, since 70.7% of respondents agreed that students who are taught using instructional media perform better academically against 3.4% who think otherwise. This view of respondents in Botswana supports the strong media effect

school of thought represented by Kozma in the Clark/Kozma debate on the effectiveness of instructional media in conceptualization of intended learning outcomes.

Question twelve was: In your opinion, what would you suggest as the average percentage gain of students taught with instructional media against the students taught using traditional ways in their academic performance? This question required the respondents to use their own experience to estimate the percentage gain of students taught using instructional media over those taught without; which could be attributed to the use of instructional media, in relation to students' academic achievement. The following table 4.21 presents the suggested average percentage gain by the respondents.

Table 4.21: Suggestion on average percentage gain

OPINON ON PERFORMAMANCE	FREQUENCY	PERCENT	VALID PERCENT
They perform 50% or better more than their counterparts	102	55.7	61.4
They perform 30-49% more than their counterparts	33	18.0	19.9
They perform 10-29% more than their counterparts	23	12.6	13.9
They perform 1-9% more than their counterparts	8	4.4	4.8
Total	**166**	**90.7**	**100.0**
Did not give opinion on average performance	17	9.3	
GRAND TOTAL	**183**	**100.0**	

The results from the table 4.21 shows that 55.7% of respondents said the average percentage gain of students taught with instructional media against students taught using traditional ways in their academic performance was that students taught using instructional media "performed 50% or better, more than their counterparts". 18% of the respondents indicated that on the average percentage gain of students taught with instructional media against students taught using traditional ways in their academic

performance was that students taught using instructional media “They performed 30-49% more than their counterparts.” Moreover, 12.6 % of the respondents said the average percentage gain was 10-29% more than their counterparts. Furthermore, 4.4% of the respondents reported that the average percentage gain of students taught with instructional media against students taught using traditional ways was 1-9% more than their counterparts. Finally, 9.3% of the respondents did not give their opinion on average percentage gain.

The Valid percentages in figure 4.5 below indicates that 81.3% of the respondents reported the average percentage gain of students taught with instructional media against students taught using traditional ways in their academic performance were that students taught using instructional media, they performed 30% to 50% better or more than their counterparts taught using traditional ways in their academic performance. 18.7% of the respondents said the average percentage gain was 1-29% better than their counterparts taught using traditional ways in their academic performance. In summary 100% of the respondents (valid percentages) agreed instructional media enhanced tertiary students’ conceptualization of intended learning outcomes, although at different percentile gain. The valid percentages are shown by figure 4.5 below

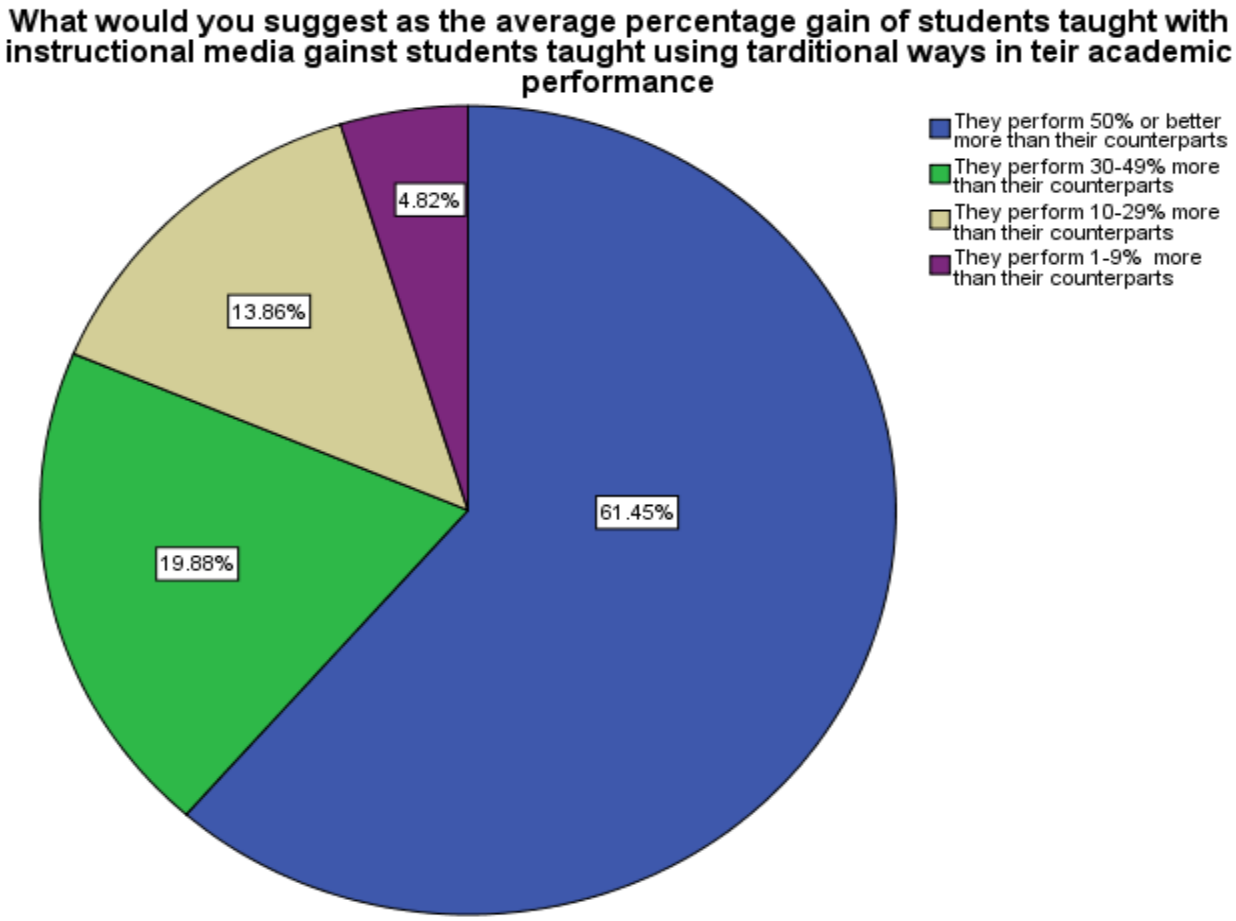


Figure 4.5: Average percentage gain

The researcher therefore, concluded that 81.3% of the respondents in Botswana reported that, the average percentage gain of students taught with instructional media over students taught using traditional ways was between 30% to 50% better or more.

Question thirteen was a follow up to questions 10, 11, and 12 and was crafted as: Make a comment about your choice of responses in questions 10, 11 & 12 above. This question thirteen asked respondents to make a comment for their choices of responses in question **(10), "**In your own opinion, is there any difference(s) in academic performance among students taught using instructional media from those taught using the traditional ways?" Question **(11)** "Select a comment for your response in question 10 above" and question **(12),** " In your opinion, what would you suggest as the average percentage gain of students taught with instructional media against the students taught

using traditional ways in their academic performance?" The following table 4.22 shows the comments made by respondents.

Table 4.22: Respondents' Comment on choice of their responses in questions 10, 11 & 12

COMMENT ON QUESTIONS 10, 11 AND 12	FREQUENCY	PERCENT	VALID PERCENT
Motivation, attentiveness, widens the scope of knowledge	56	30.6	83.6
Both instructional media and traditional media complement each other	9	4.9	13.4
Traditional ways of teaching are better	2	1.1	3.0
TOTAL	**67**	**36.6**	**100**
NOT COMMENTED	70	38.3	
GRAND TOTAL	**183**	**100**	

The results of Table 4.22 indicate that 30.6% commented that instructional media increased Motivation, attentiveness, and widens the scope of knowledge. 4.9% of the respondents on comment indicated that, "instructional media and traditional media complemented each other. 1.1% of the respondents said that, "Traditional ways of teaching were better than teaching using instructional media." Furthermore, 38.3% of the respondents "did not make a comment."

Valid percentages show 83.6% of respondents, commented that instructional media provided "Motivation, attentiveness, and widens their scope of knowledge." 13.4% of respondents, commented that, "Both instructional media and traditional media complemented each other." 3% of respondents commented that, "Traditional ways of teaching were better."

Therefore, the researcher concluded that 83.6% of the respondents in Botswana, commented that instructional media provided "Motivation, attentiveness, and widened the tertiary students' scope of knowledge." As reasons why students who are taught using instructional media gain academically and perform better than those who are

using the traditional ways of instruction, as well as the reasons why there was a difference generally between performance of the said two groups of students; those who are taught using instructional media and those who are taught using the traditional ways of instruction.

Question fourteen was one of the core questions phrased as follows: Is there any relationship between instructional media and tertiary students' conceptualization of intended learning out comes? The purpose of this question was to find out from respondents whether there was a relationship existing between instructional media and student conceptualization of intended learning outcomes, form their own knowledge, educational experience and understanding. The following table 4.23 presents the responses to question fourteen.

Table 4.23: Relationship between instructional media &conceptualization

RESPONSES	FREQUENCY	PERCENT	VALID PERCENT
Yes	104	56.8	59.8
Somehow yes	45	24.6	25.9
I don't know	18	9.8	10.3
Somehow no	1	.5	.6
No	6	3.3	3.4
TOTAL	**174**	**95.1**	**100.0**
Did not Respond	9	4.9	
GRAND TOTAL	**183**	**100.0**	

In table 4.23, 56.8% of respondents said "Yes" there was a relationship between instructional media and tertiary students' conceptualization of intended learning out comes. 24.6% of respondents said "somehow yes". 9.8% of respondents said, "they did not know" if there was any relationship between instructional media and tertiary

students' conceptualization of intended learning out comes. 0.5 % indicated "Somehow no". 3.3% indicated "No" relationship between instructional media and students' conceptualization of intended learning outcomes.

Figure 4.6 below, shows the valid percentages as indicating that, 59.8% of respondents agreed that, "yes" there was a relationship between instructional media and tertiary students' conceptualization of intended learning out comes. 25.9% said somehow yes, there was a relationship. 10.3% did not know whether there was a relationship or not between instructional media and tertiary students' conceptualization of intending outcomes.3.4% of respondents indicated "no" there was no relationship between instructional media and tertiary students' conceptualization of intended learning out comes. The below pie chart indicates the valid response in figure 4.6 below.

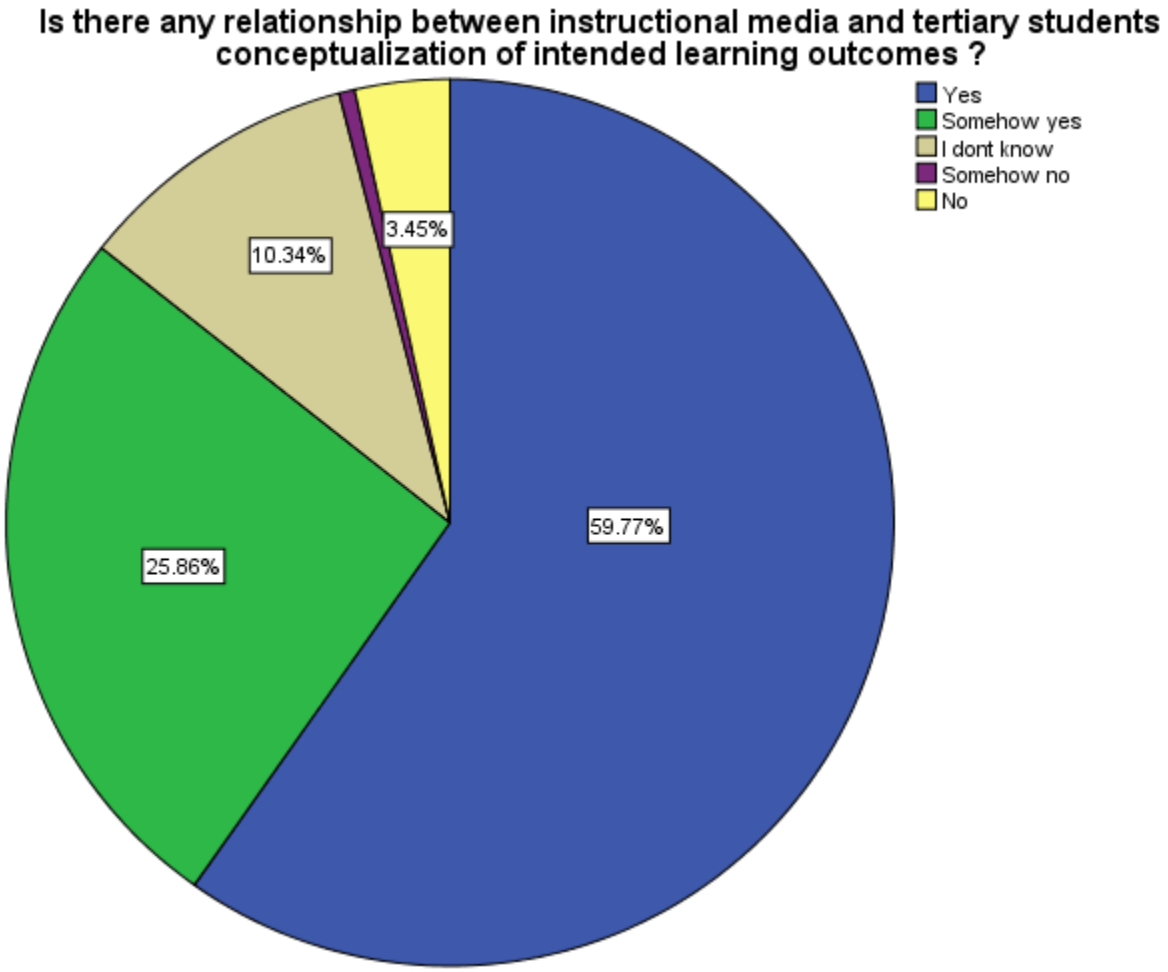


Figure 4.6: Relationship between instructional media and conceptualization

The researcher summarized that 85.7% of respondents agreed that, “Somehow yes to yes” there was relationship between instructional media and tertiary students’ conceptualization of intended learning out comes.

4% of respondents indicated “somehow no to no**”** there was no relationship between instructional media and tertiary students’ conceptualization of intended learning out comes.10.3% did not know whether there was a relationship or not between instructional media and tertiary students conceptualization of intending outcomes.

It was concluded that 85.7% of respondents in Botswana reported there was a relationship between instructional media and tertiary students’ conceptualization of intended learning outcomes.

Question fifteen, followed: How would you describe the relationship you have identified in question 14 above in terms of tertiary students’ conceptualizations of intended learning outcomes? This question sought respondents to describe the relationship between instructional media and tertiary students’ conceptualization of intended learning outcomes, as they had identified in question **(14)** above. Table 4.24 shows the respondents’ descriptions of the relationship between tertiary students’ conceptualization of intended learning out and instructional media used in teaching and learning process.

Table 4.24:Description of the relationship

DESCRIPTION OF RELATIONSHIP	FREQUENCY	PERCENT	VALID PERCENT
Positive	98	53.6	57.6
Somehow positive	42	23.0	24.7
Not sure	22	12.0	12.9
Somehow negative	6	3.3	3.5
Negative	2	1.1	1.2
TOTAL	**170**	**92.9**	**100.0**
Did not give descriptions	13	7.1	
BRAND TOTAL	**183**	**100.0**	

The table 4.24 shows that 53.6% of the respondents described the relationship between instructional media and tertiary students' conceptualization of intended learning outcomes as **positive**. 23% of the respondents said **somehow positive** relationship**.** 12% of respondents were **not sure** how to describe the relationship between instructional media and tertiary students' conceptualization of intended learning outcomes. 3.3% of the respondents described the relationship as **somehow negative.**1.1% of the respondents said the relationship was negative**.**7.1% did not describe the relationship between instructional media and tertiary students' conceptualization of intended learning outcomes.

However, looking at valid percentages indicated that: 82.3% of the respondents described the relationship between instructional media and tertiary students' conceptualizations of intended learning outcomes as **somehow positive** to **positive**

relationship. 12.9% of the respondents were not sure how to describe the relationship. 3.7% of the respondents said **somehow negative** to **negative** relationship.

Therefore, the researcher concluded that 82.3% of the respondents in Botswana described the relationship between instructional media and tertiary students' conceptualization of intended learning outcomes as **somehow positive** to **positive.** 3.7% of the respondents indicated the relationship between instructional media and tertiary students' conceptualizations of intended learning outcomes as **somehow negative** to **negative.** 12.9% of the respondents were not sure how to describe the relationship.

Question sixteen of this objective was phrased as follows: How do you rate your description of the relationship which you identified in question 15 above, in terms of tertiary students' conceptualization of intended learning outcomes? The purpose of this question wanted the respondents to rate their descriptions which they had identified in question (15) above using ordinal scale provided of the relationship between instructional media and tertiary students' conceptualization of intended learning outcomes. The following Table 4.25 presents the results of question sixteen.

Table 4.25: Rating Respondents' description in question 15

VARIABLES	FREQUENCY	PERCENT	VALIDPERCENT
Very strong	45	24.6	26.8
Strong	91	49.7	54.2
No opinion	24	13.1	14.3
Weak	6	3.3	3.6
Very weak	2	1.1	1.2
Total	**168**	**91.8**	**100.0**
Did not respond	15	8.2	
Grand Total	**183**	**100.0**	

Results from table 4.25 shows that 24.6% of the respondents rated their description of relationship between instructional media and tertiary students' conceptualizations of intended learning outcomes as a **very strong** relationship. 49.7% of the respondents rated their description of relationship between instructional media and tertiary students' conceptualizations of intended learning outcomes as a **strong** relationship.13.1% of the respondents had **No opinion** on rating their descriptions of relationship between instructional media and tertiary students' conceptualization of intended learning outcomes. 3.3% of the respondents rated their description of relationship between instructional media and tertiary students' conceptualizations of intended learning outcomes as a **weak** relationship.1.1% of the respondents rated their description as a **very weak** relationship.

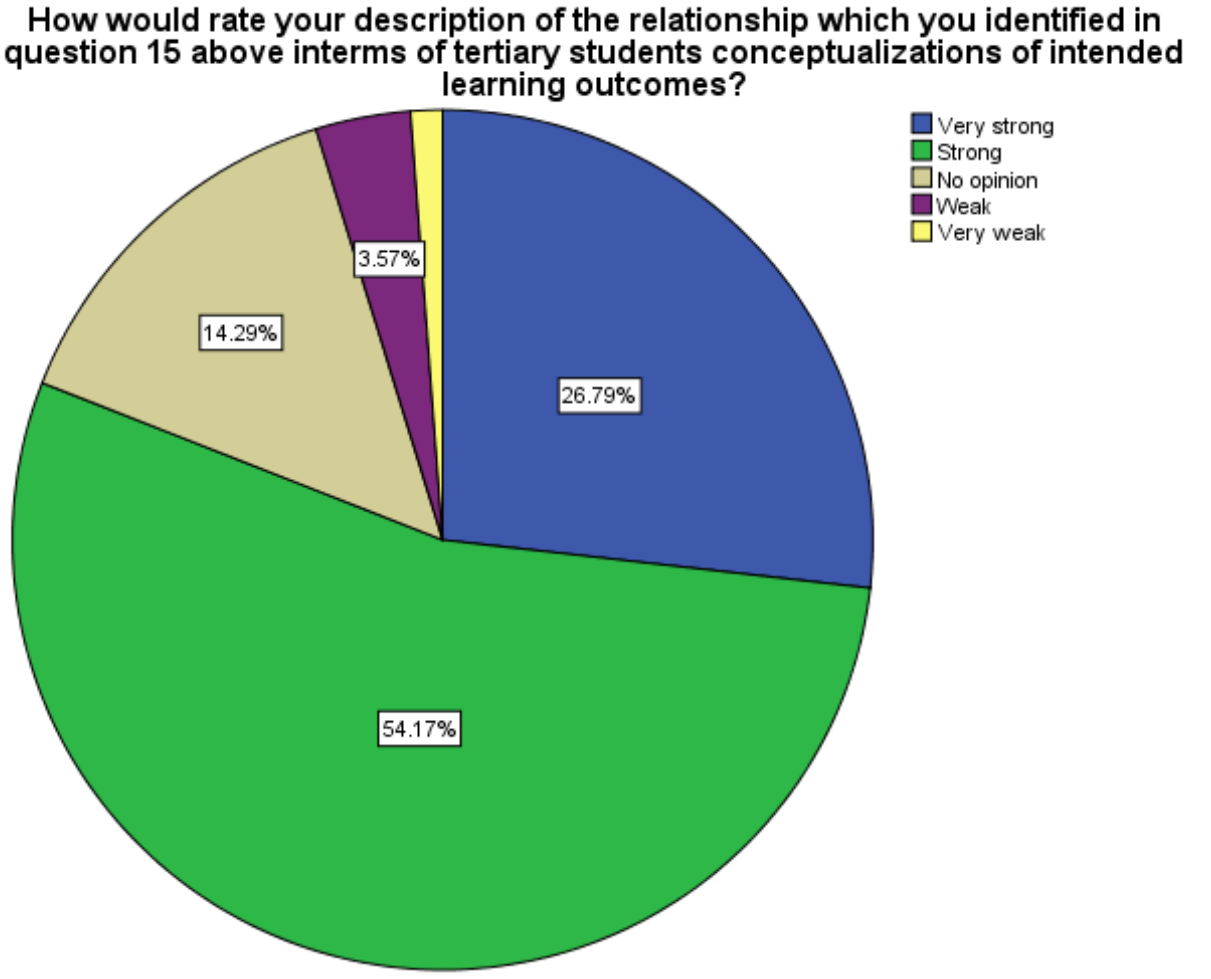


Figure 4.7: Rating descriptions in question 15

Valid percentages in figure 4.7 above indicate that 81% of the respondents rated their description of relationship between instructional media and tertiary students' conceptualizations of intended learning outcomes as **strong** to **very strong** relationship. 14.3% of the respondents had **No opinion** on rating their descriptions of relationship. 4.8% of the respondents rated their description as **weak** to **very weak** relationship.

Therefore, the researcher concluded that: 81% of respondents in Botswana described the relationship between instructional media and tertiary students' conceptualization of intended learning outcomes as strong to very strong. 4.8% of the respondents described the relationship as weak to very weak. 14.3% of the respondents had no opinion. It was then concluded that respondents in Botswana viewed the relationship between instructional media and tertiary students' conceptualization of intended learning outcomes to be strong to very strong.

Question seventeen is the last question under objective two and sub question four of this study, this question was presented as: Give reason(s) for your responses in questions 14, 15 &16. The purpose of this question was to provide the respondents with an opportunity to express personal reasons for their responses to question **(14) -** is there any relationship between instructional media and tertiary students' conceptualization of intended learning out comes? Question **(15) -**How would describe the relationship you have identified in question 14 above in terms of tertiary students' conceptualization of intended learning outcomes? And question **(16)-**how do you rate your description of the relationship which you identified in question 15 above, in terms of tertiary students' conceptualization of intended learning outcomes? The following Table 4.26 provides a summarized thematic reasons form respondents.

Table 4.26: Respondents reasons for questions 14, 15 16

REASONS	FREQUENCY	PERCENT	VALID PERCENT
Visual instruction, skills, improved learning, interest , organized	38	20.8	39.1
Easy to use, active participation, better results	21	11.5	21.6
Helps in communication, more interesting, gain appropriate skills	26	14.2	26.8
Tertiary students are responsible	2	1.1	2.1
Do not use Instructional media	8	4.4	8.2
Advancement of technology	2	1.1	2.1
TOTAL	**97**	**53.1**	**100**
Did not give reason(s)	86	46.9	
GRAND TOTAL	**183**	**100**	

The table 4.26 shows that 20.8% of the respondents gave the following reasons: that instructional media gave visual instruction, skills are improved, and improved learning, aroused interest, and learning became organized. 11.5% of the respondents gave the following reasons: Easy to use, active participation of learners, and better results. 14.2% of the respondents gave the following reasons: instructional media helped in communication, instructional media made learning to be become more interesting, students gained appropriate skills.1.1% of the respondents gave the following reason: tertiary students were responsible. 4.4% of the respondents gave the following reason: they did not use instructional media in teaching and learning process. 1.1% of the respondents gave the following reason: instructional media is part of technological advancement.

Valid percentages indicate that 87.5% of respondents gave the following reasons: Visual instruction, skills are improved, improved learning, interest, organized, easy to use, active participation of the learners, better results and helped in communicating, learning became more interesting, students gain appropriate skills.10.3% of respondents gave the following reasons: do not use Instructional media and Tertiary

students were responsible enough. 2.1% of the respondents gave the following reason: instructional media as part of advancement of technology.

The researcher, then concluded that (87%) of respondents in Botswana said the reasons were: Visual instruction, skills, improved learning, interest, organized, easy to use, active participation, better results and helped in communicating, learning became more interesting, students gain appropriate skills. This was against 10.3% of respondents who gave the following reasons that they do not use instructional media and tertiary students were responsible enough. 2.1% of the respondents gave the following reason: Advancement of technology.

4.9.3 Objectives Three (3)

The last of objective of this study was developed in order to address the research question of this study, and it was phrased as follows: To establish the status of instructional media usage, in the tertiary sector of education. This objective sought to find out whether tertiary institution lectures or tutors use instructional media during teaching and learning. If they use instructional media, how often do they use instructional media? Is this use an individual initiative or an institutional requirement? This research objective has two sub questions to assist to answer this objective. These sub questions were spelt out in order to fully address the requirements of this objective, and the two sub questions five and six were developed.

Sub question Five was phrased as follows; to what extent does the students' academic performance justify the financial resources used to purchase instructional media? This sub question required that respondents state roughly how much each of their departments, faculties and the institutions used in purchasing and maintaining instructional media. This sub question further required respondents to evaluate the financial resources implications Vis-a'-vis tertiary students conceptualization of intended learning outcomes. This sub question was answered from information supplied for questions 18, 19 and 20 by respondents from questionnaires as follows:

Question eighteen (18) was presented as: How much roughly do you spend annually on purchasing and maintenance of instructional media? This question asked the respondents to indicate how much they used to buy instructional media as a

department, and or as a faculty and or as an institution. The following tables and figures present the expenditure as a department, faculty and institution.

Table 4.27: Expenditure on instructional media as departments

AMOUNTS -DEPARTMENT	FREQUENCY	PERCENT	VALID PERCENT
Less than P200 000	34	18.6	73.9
Above P200 000-P400 000	9	4.9	19.6
Above P400 000- P600 000	2	1.1	4.3
Above P800 000	1	.5	2.2
TOTAL	**46**	**25.1**	**100.0**
Did not give amounts	137	74.9	
GRAND TOTAL	**183**	**100.0**	

The table 4.27 indicates that 18.6% of the respondents said less than P200 000 annually on purchasing and maintenance of instructional media as a department. 4.9% of the respondents reported P200 000-P400 000 annually. 1.1% of the respondents said P400 000- P600 000 annually. 0.5% of the respondents reported above P800 000 annually on purchasing and maintenance of instructional media.

Figure 4.8 below, shows the valid percentages on the departmental expenditure on instructional media.

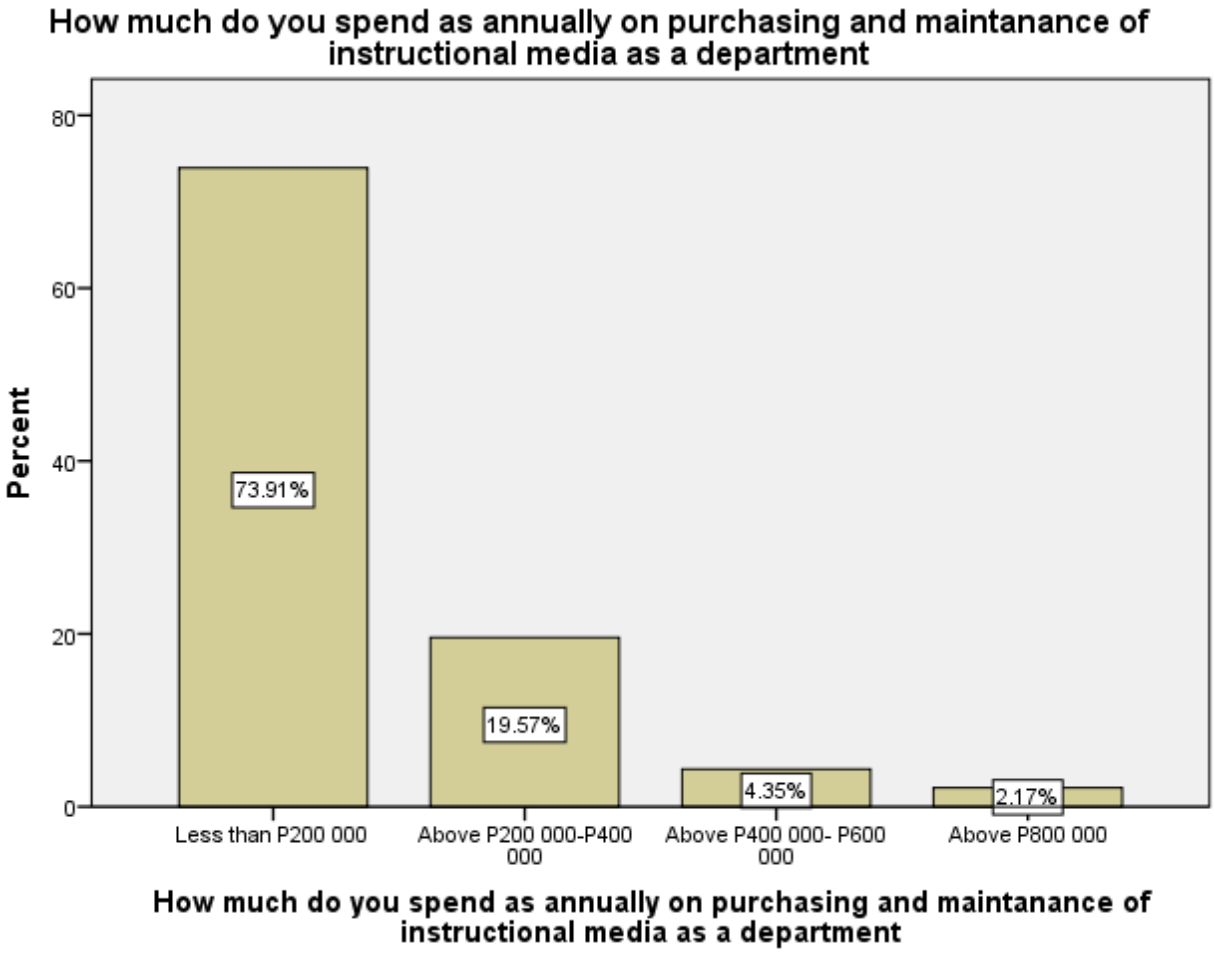


Figure 4.8: Departmental expenditure on instructional media

Valid percentages indicate in figure 4.8 show that 73.9% of the respondents reported that they spent less than P200 000 annually on purchasing and maintenance of instructional media as a department.19.6% of the respondents said Above P200 000-P400 000. 4.3% of the respondents indicated that they used above P400 000- P600 000 annually on purchasing and maintenance of instructional media. 2.2% of the respondents reported used above P800 000 annually on purchasing and maintenance of instructional media.

Table 4.28: Expenditure as a faculty on instructional media

AMOUNTS-FACULTY	Frequency	Percent	Valid Percent
Less than P200 000	4	2.2	80.0
Above P200 000-P400 000	1	.5	20.0
TOTAL	**5**	**2.7**	**100.0**
Did not give amounts	178	97.3	
GRAND TOTAL	**183**	**100.0**	

Table 4.28 indicates that 2.2% of the respondents reported that less than P200 000 annually on purchasing and maintenance of instructional media as a faculty. 0.5% of the respondents said that they spent above P200 000-P400 000 annually. 97.3% of the respondents did not specify the amounts they spent annually on purchasing and maintenance of instructional media as a faculty. The valid percentages for expenditure as a faculty is indicated by figure 4.9 below.

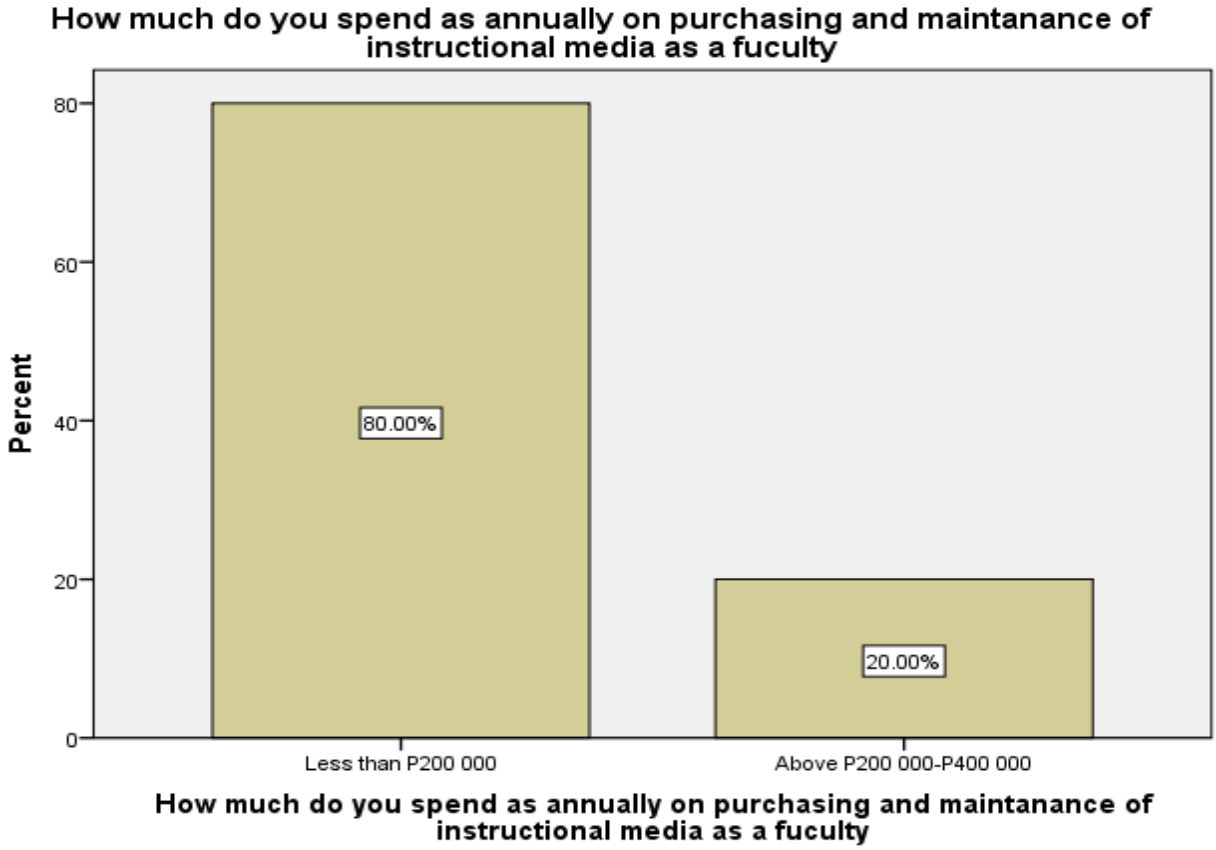


Figure 4.9: Expenditure as a faculty on instructional media

Figure 4.9 the valid percentages, 80% of the respondents said less than P200 000 annually on purchasing and maintenance of instructional media as a faculty. 20% of the respondents reported above P200 000-P400 000 annually on purchasing and maintenance of instructional media as a faculty.

How much do is spent annually on purchasing and maintenance of instructional media as an institution?

This part of the question required respondents to indicate how much they spent on instructional media as an institution

Table 4.29: Expenditure as an institution on instructional media

AMOUNTS-INSTITUTION	Frequency	Percent	Valid Percent
Less than P200 000	30	16.4	81.1
Above P200 000-P400 000	5	2.7	13.5
Above P800 000	2	1.1	5.4
TOTAL	**37**	**20.2**	**100.0**
Did not give amounts	146	79.8	
GRAND TOTAL	**183**	**100.0**	

Table 4.29 shows that 16.4% of the respondents reported that they spent less than P200 000 annually on purchasing and maintenance of instructional media as an institution.2.7% of the respondents said above P200 000-P400 000. 1.1% of the respondents spent above P800 000 annually on purchasing and maintenance of instructional media as an institution.79.8% of the respondents did not report how much they spent annually on purchasing and maintenance of instructional media as an institution.

The following figure 4.10 below shows the valid percentages on institutional expenditure on instructional media and the maintenance of the instructional media.

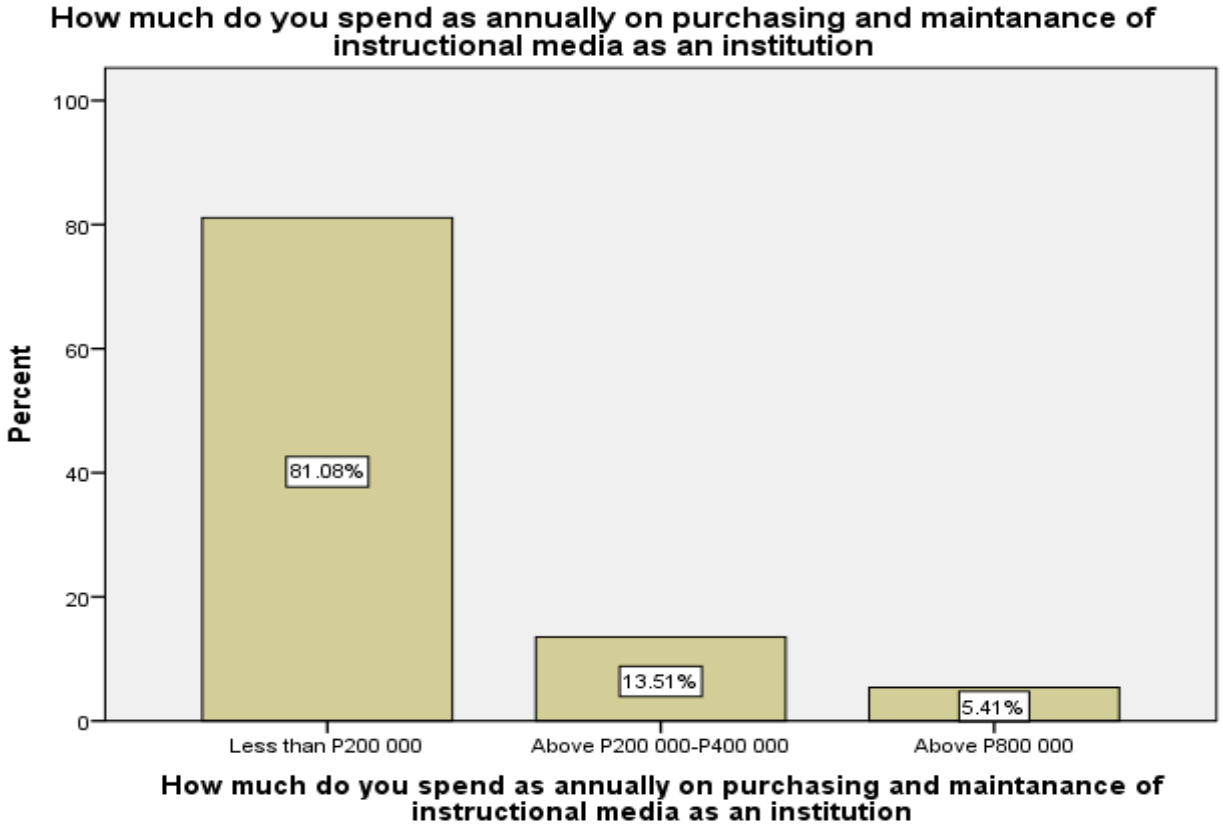


Figure 4.10: Institutional expenditure on Instructional media

The valid percentages in figure 4.10 above indicate that 81.1% of the respondents said that they spent less than P200 000 annually on purchasing and maintenance of instructional media as an institution. 13.5% of the respondents spent above P200 000-P400 000 annually. 5.5% of the respondents spent above P800 000 annually on purchasing and maintenance of instructional media as an institution.

The researcher concluded that the amount that was spent to purchase and maintain instructional media as a department, or faculty or institution on average was between P200 000 to P800 000 annually.

Question nineteen (19), followed and it was phrased as follows: in your opinion, evaluate the usage of your chosen amount in question 18. The purpose of this question required respondents to evaluate the usage of the amount they indicated in question **(18**), whether as a department, faculty and or institution used the money to purchase

and maintaining instructional media was put to good use or not. The evaluation was against evaluative statements provided as shown by the table 4.30 below.

Table 4.30: Respondents' evaluation of the amount in question 18

EVALUATION OF USAGE	REQUENCY	PERCENT	VALID PERCENT
The money is put to very good use	25	13.7	20.3
The money is put to good use	48	26.2	39.0
I don't know	35	19.1	28.5
The money is not put to good use	12	6.6	9.8
The money is not put to very good use	3	1.6	2.4
TOTAL	**123**	**67.2**	**100.0**
Did Not Evaluate Usage	60	32.8	
GRAND TOTAL	**183**	**100.0**	

Table 4.30 shows that 13.7% of the respondents said the money was put to very good use. 26.2% of the respondents indicated that the money was put **to good use.**19.1**%** of the respondents did not know whether the money was put to good use or not. 6.6% of the respondents reported that the money was **not put to good use.**1.6% of the respondents said the money **was not put to very good use**. 32.8% of the respondents did not give their evaluation of the usage of money to purchase and maintain instructional media at tertiary level of education in Botswana. Figure 4.11 below, shows the valid percentages on the evaluation of funds used to purchase instructional media as well as maintaining those purchased instructional media.

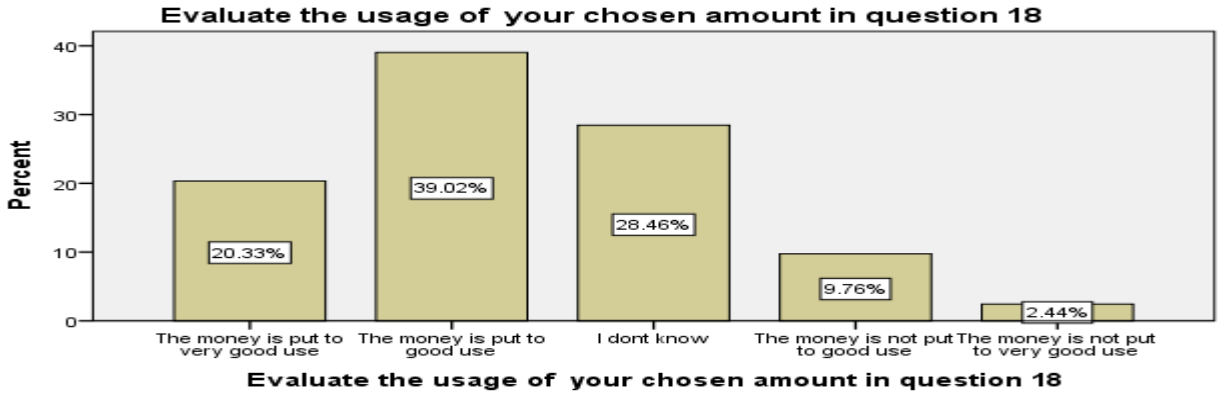


Figure 4.11: Evaluation of the amount in question 18

The valid percentages for this question in figure 4.11 above indicate that 59.3% of the respondents evaluated the usage of money as was being put **to good** and **very good use.** 28.5% of the respondents did not know whether the money was put **to good use** or **not to good use.**12.2% of the respondents evaluated the usage of money as being n**ot put to good** use and **not put to very good use**.

The researcher therefore concluded that 59.3% of the respondents in Botswana evaluated the usage of money in buying and maintaining of instructional media was put to **Good and Very good use**, against 12.2% of the respondents evaluated the usage of money as being n**ot put to good** use and **not put to very good use**. 28.5% of the respondents in Botswana did not know whether the usage of the money was put to good use or not. Therefore, the majority of respondents in Botswana agreed that the funds used to purchase instructional media and their maintenance was put to good and very good use.

Sub question Six (6) was the last sub question for this study, which was phrased as follows: What types of instructional media are frequently used at tertiary level of education? This sub question asked respondents to provide the types of instructional media they used and their frequency of use during teaching and learning process in their institutions for tertiary students' conceptualization of intended learning outcomes.

This sub problem was answered from information provided for questions 20, 21 and 22 of the questionnaire of this study as indicated below:

Question twenty (20), in order to fully address the concerns of sub question six was phrased as follows: Which instructional media do you frequently use in your institution/ when you teach? This question asked the respondents to name instructional media which they frequently used in their institution or when they taught. Its purpose also was to find out which media were readily available in tertiary institutions in Botswana. The following Table 4.31 presents the responses.

Table 4.31: Instructional media frequently used in Respondents' institutions

INSTRUCTIONAL MEDIA FREQUENTLY USED	FREQUENTLY	PERCENT	VALID PERCENT
Computer and accessories	61	33.3	38.6
Models	14	7.7	8.9
Charts and other illustrations	31	16.9	19.6
Combination of any of the above	52	28.4	32.9
TOTAL	**158**	**86.3**	**100.0**
Did not respond	25	13.7	
GRAND TOTAL	**183**	**100.0**	

Table 4.31 shows that 33.3% of respondents frequently used computers and accessories.7.7% of respondents frequently used teaching/learning models.

16.9 % of respondents used charts and other illustrations of teaching and learning.28.4% of respondents used a combination of any of the above

13.7% of respondents did not indicate the media they frequently used as an institution or when they taught. Figure 4.12 below shows the valid percentages of frequently used instructional media by respondents in Botswana.

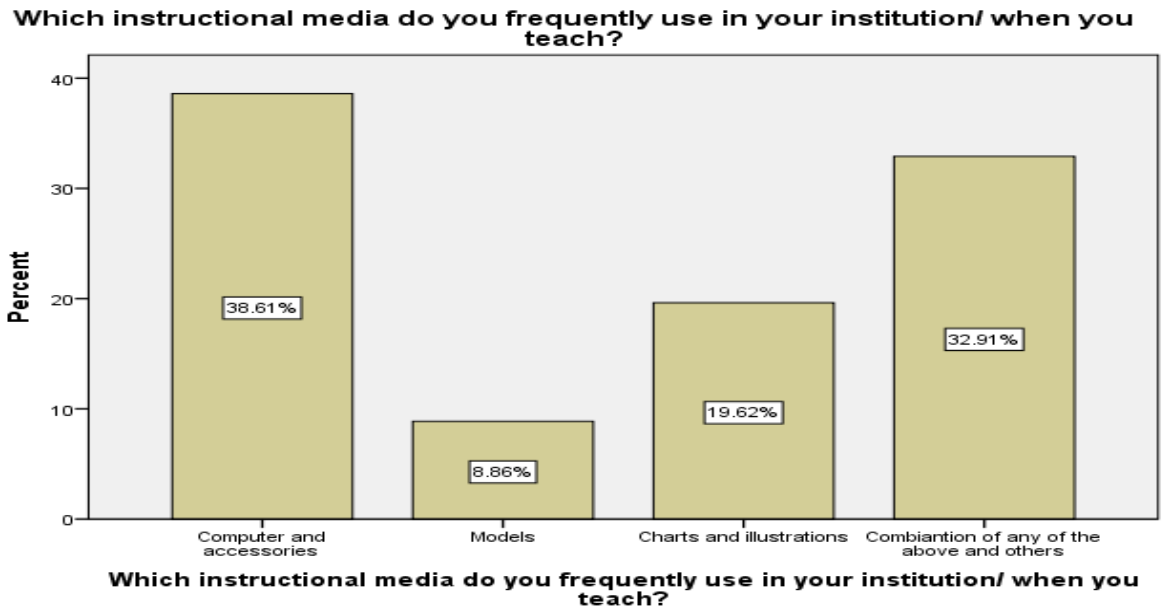


Figure 4.12: Instructional media frequently used by Respondents

However, valid percentages shown by figure 4.12 indicate that 38.6% of the respondents used commuters and accessories. 8.9% of respondents used teaching and learning models.19.6%of respondents used charts and other illustrations of teaching and learning. 32.9% of respondents used a combination of the above instructional media.

Therefore, the researcher concluded that respondents in Botswana mostly used the following instructional media in their institutions or during the teaching process: computers and accessories, Combination of instructional media and charts & other illustrations.

Question twenty-one (21) was developed as follows: Why do you use the instructional media mentioned in question 20 above? This questioned asked the respondents to identify the reason(s) why they frequently used the instructional media which the respondent(s) mentioned above in question **(20).** The following Table 4.32 presents the following data:

Table 4.32: Respondents' reasons for using Instructional media in question 20

REASONS FOR FREQUENTLY USING INSTRUCTIONAL MEDIA	FREQUENTLY	PERCENT	VALID PERCENT
Very cheap	8	4.4	5.7
Easy to use	57	31.1	40.4
Just available only	47	25.7	33.3
Organizational culture	23	12.6	16.3
No reasons	6	3.3	4.3
TOTAL	141	77.0	100.0
Did not give reasons	42	23.0	
GRAND TOTAL	**183**	**100.0**	

The table 4.32 shows that 4.4% of the respondents reported that they frequently used "the instructional media" because it was very **cheap.** 31.1% of the respondents said that they frequently used "the instructional media" because it was **easy to use.**25.7% of the respondents indicated the media was **just available.** 12.6**%** of the respondents reported it was because of **organizational culture.** 3.3% of the respondents, did not have reasons.23% of the respondents did answer the question. Figure 4.13 below shows the valid percentages as follows:

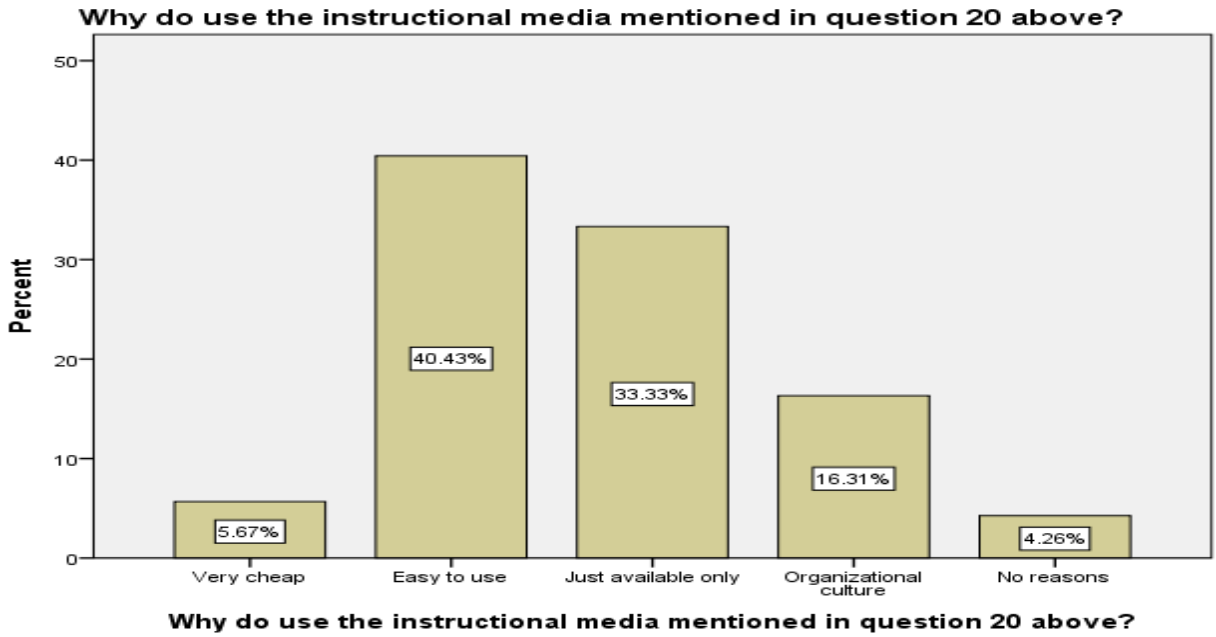


Figure 4.13: Reasons for using instructional media mentioned in question 20

Looking at valid percentages, figure 4.13 shows that 5.7 **%** of the respondents frequently used "that instructional media" because it was very **cheap.** 40.4**%** of the respondents reported it was **easy to use.** 33.3% of the respondents indicated **just available.**16.3% of the respondents said **organizational culture.** 4.3% of the respondents did not have reasons why they frequently used "the instructional media." Therefore **three main reasons** why respondents frequently used "that instructional media" were: easy to use, were just available and also because of their organizational culture.

The researcher then concluded that; 73.3% respondents in Botswana used frequently "the" instructional media because that "the instructional media" were **easy to use** and they were **just available** in their institutions. 16.3% of respondents reported that they frequently used "the" media because it was the respondents' organizational culture.

NB: The use of bold face indicates the reason that was given by the respondents.

Question twenty-two (22) was the last question for this study and this question was phrased as follows: Make a comment about questions 20 and 21. Question 22 required respondents to make a comment on the two questions above. The questions were:

Question **(20) "**which instructional media do you frequently use in your institution/ when you teach?" and question **(21**) "why do you frequently use the instructional media mentioned in question 20 above? Table 4.33 below presents the comments from respondents summarized thematically.

Table 4.33: Respondents' comments on questions 20 and 21

COMMENT	**FREQUENCY**	**PERCENT**	**VALID PERCENT**
Improved learning	45	24.6	38.1
Lack of resources	53	29	44.9
Instructional media available	12	6.6	10.2
Instructional media expensive	5	2.7	4.2
No comment	3	1.6	2.5
TOTAL	**118**	**64.5**	**100**
COMMENT NOT GIVEN	65	35.5	6.5
GRAND TOTAL	**183**	**183**	

The table 4.33 above shows that 24.6% of the respondents said instructional media **improved learning.** 29% of the respondents commented that it was as a result of **lack of resources.**6.6% of the respondents reported that it was the **only instructional media available**.2.7% of the respondents said **instructional media were expensive.**1.6% of the respondents said they had **No comment.** 35.5% of the respondents did not provide a comment.

Valid percentages indicate that: 38.1% of the respondents commented that instructional media **improved learning.**44.9% of the respondents commented it was **lack of resources.** 10.2% of the respondents reported that it was **only instructional media available.** 4.2% of the respondents indicated that i**nstructional media were expensive.** Finally 2.5% of the respondents reported that they had **No comment.**

Therefore the researcher concluded that the main reasons why respondents used the same media frequently were that: **Lack of resources (**in this case other resources for variety)**. Improved learning and** it were the **only instructional media available.**

4.10 Theoretical findings

Literature reviews on the current debate on the effectiveness of instructional media in conceptualization of intended learning outcomes, from the time of Clark/Kozma debate of 1994, has resulted in two schools of thought. These schools of thought are a result about the question on the effectiveness of instructional media in the teaching and learning process: The strong media effect school of thought and the weak media effect school of thought. Further studies by proponents of each school of thought, and other scholars, to find out the role of instructional media in conceptualization of intended learning outcomes, resulted in proliferation of researches in different angles making the debate to lose focus and becomes difficult to get the head or tail of the debate. The theoretical findings are that: (a) there is no conclusive evidence on the effectiveness of instructional media in the teaching and learning process. (b) The debate is still going on about the role of instructional media in the conceptualization of intended learning outcomes, and a new call to move away from instructional media effects paradigm so as to change the focus of instructional media debate in order to have a productive outcome. Finally (c) The current debate on the effectiveness of instructional media in the conceptualization of intended learning outcomes produced a mixed effect school of thought; that either supports or negates both schools of thought, making the instructional media effect debate becoming more complicated as the essence of this debate becomes questionable in these circumstances.

4.11 Summary chapter four (4)

(a) Empirical findings

OBJECTIVE ONE (1)

The first objective of this study was, "**To examine and describe the effectiveness of instructional media in the conceptualization of intended learning outcomes at tertiary level of education."** This objective sought to find out and describe the current practices of instructional media, and how educators (Lecturers/tutors) view instructional media's effectiveness in tertiary students' conceptualization of intended learning outcomes in Botswana. This objective had two sub questions; sub questions one and two. Sub question one had the following findings: 73.6% of respondents used instructional media, against 26.4% of the respondents who did not use instructional media. 97.3% of tertiary educators in Botswana said instructional media were a necessity in the tertiary students' conceptualization of intended learning outcomes, against 0.5% of the tertiary educators in Botswana who said instructional media were unnecessary in the conceptualization of intended learning outcomes

98.9% of respondents in Botswana agreed to fact that instructional media were relevant in the teaching and learning at tertiary level of education, against 1.1% of respondents who disagreed that instructional media were relevant in the teaching and learning at tertiary level in Botswana.

92.4% of respondents reported that instructional media were necessary in tertiary students' conceptualization of intended learning outcomes and relevant in the teaching and learning at tertiary level of education in Botswana, against 7.4% of respondents who reported that instructional media were necessary and relevant in tertiary students' conceptualization of learning outcomes, in that ; instructional media assisted learners to carry individual researches, assisted special education students and kept student abreast with technological changes.

Sub question two (2), had the following findings: 61% of respondents in Botswana used instructional media during teaching and learning process from **lesser extent** to **greater extent** against 32.7% of respondents who **rarely** to **not often** used instructional media

during teaching and learning process. 81.7% of respondents in Botswana used instructional media during the actual teaching and learning process against 13.8% of respondents who **seldom** used instructional media during the actual teaching and learning process.43.7% of the respondents used instructional media every lecture to once/twice a month, and 56.4% of respondents used instructional media when appropriate, in tertiary students' conceptualization of intended learning outcomes during teaching and learning process. The extent and frequency of using instructional media in tertiary students' conceptualization of intended learning outcomes were influenced by the following factors: lack of resources (44.9%), effective teaching and making concepts understood better (38.1%). Only instructional media available (10.2%). Those who did not indicate their reasons (6.5%).

OBJECTIVE TWO (2)

The purpose of the second objective was, "**To justify and verify, if there is a correlation between instructional media and students' academic achievement, at tertiary level of education.** This objective sought to find out if some relationship exists between instructional media and tertiary students' academic achievement, so as to justify and verify the correlation as seen from the educators' point of view. This objective had two sub questions **(3)** and **(4).**

Sub question three (3) had the following findings: 88.7% of respondents in Botswana **agreed** to **strongly agreed** that there were some other benefits of using instructional media in the teaching and learning process as opposed to 4.4% of the respondents who **disagreed** to **strongly disagreed** that there were some other benefits of using instructional media in the teaching and learning process.

Sub question four (4)'s findings indicated that: (81%) of respondents in Botswana said that: there were some differences in tertiary students' conceptualization of intended learning outcomes among students taught using instructional media from those taught using the traditional ways, against 6.1% of the respondents who reported that there were no differences in academic performance among students taught using instructional media from those taught using the traditional ways**.**70.7% of respondents in Botswana reported that instructional media enhanced tertiary students' conceptualization of

intended learning outcomes against 7.5% of the respondents who commented, “The students generally perform the same academically**.”** 3.4% of the respondents commented that **“**Students who are taught using traditional ways perform better academically**”**

The valid percentages showed 100% of the respondents in Botswana agreed instructional media enhanced tertiary students’ conceptualization of intended learning outcomes, although at different percentile gains.83.6% of respondents commented that instructional media provided “Motivation, attentiveness, and widened the tertiary students’ scope of knowledge.” 13.4% of respondents stated that, “Both instructional media and traditional media complemented each other.” And 3% of respondents, commented that, “Traditional ways of teaching were better”.

OBJECTIVE THREE (3)

The purpose of this objective was “**To establish the status of instructional media usage, in the tertiary sector of education**.” This objective sought to find out whether tertiary institutions’ lecturers or tutors use instructional media during teaching and learning. If they use instructional media, how often do they use instructional media? Is the **use** an individual initiative or an institutional requirement? This objective had two sub questions; sub questions **(5)** and **(6)**.

Sub question five (5) had the following summary findings: The valid percentages, report that 81.1% of the respondents said that they spent less than P200 000 annually on purchasing and maintenance of instructional media as an institution. 13.5% of the respondents reported they spent above P200 000-P400 000 annually. 5.5% of the respondents indicated they spent above P800 000 annually on purchasing and maintenance of instructional media as an institution.

Sub question six (6)’s findings were: 38.6%, of respondents used **computers and accessories.** 32.9% of respondents’ used **combination of instructional media.**19.6% of respondents Charts **and other illustrations.** The reasons why respondents frequently used “that instructional media” Were: 40% of respondents said they were **easy to use.**33.3% of respondents reported that they **were just available** and 16.3% indicated that it was **organizational culture.**

(b) Conclusions on theoretical findings

The strong media effect school of thought and the weak media effect school of thought resulted in the third and emerging thinking that neither supports nor negates either of two schools of thought about the effectiveness of instructional media. The third emerging thinking further complicates the debate on the effectiveness of instructional media. The findings are that: (a) up to date there is no conclusive evidence on the effectiveness of instructional media in the teaching and learning process. (b) The debate is still going on about the role of instructional media in the conceptualization of intended learning outcomes, with a call to change the focuses of the debate. Finally (c) The current debate on the effectiveness of instructional media in the conceptualization of intended learning outcomes seems to lose focus as researches concentrate on different aspects of instructional media and a new call to move away from instructional media effects paradigm so as to change the focus of instructional media debate in order to have a productive outcome.

4.12 RELIABILITY AND CONSISTENCY OF EMPIRICAL RESULTS FINDINGS

To ascertain the reliability and consistency of the empirical results, the researcher analyzed the results according to the demographic variables of the respondents; gender, age, highest qualification, years of teaching experience at tertiary level of education and position the respondents held at the time of the survey. The purpose of this was to find out if the variables influenced significantly the overall perception of the respondents on the role of instructional media in tertiary students' conceptualization of intended learning outcomes in Botswana.

4.12.1The gender variable

The responses of each gender are summarized question by question using valid percentages. This was done because the variables are two; male and female unlike other variables which are more than two and their responses have been put in to one continuous table *(see variables 4.12.2 to 4.12.5)*. The purpose was to find out whether the perception of respondents on each question was gender biased or not, so as to affect the reliability of the final research results of this study. In this study, the researcher is not comparing percentages perse between gender, but looking at the similarities and differences in the views or perception or thought in responding to the

questions or in the selection of the responses. The following are the responses by gender variable in table 4.34 below.

Responses by the respondents' gender variable

Question 1

Do you use instructional media in the teaching and learning process at tertiary level of education?

Table 4.34: Responses by the respondents' gender variable

Variables	Males	Percentages	Females	Percentages	Percentage Difference
Yes	71	72.45%	38	63.33%	9.12%
No	27	27.55%	22	36.67%	9.12%
Total	98	100%	60	100%	

Question one shows that 72.45 % of male respondents used instructional media in comparison to 63.33 % of female respondents who used instructional media during teaching and learning at tertiary level of education in Botswana. The majority of both male and female respondents used instructional media; in this question no gender may be attributed to have an influence on the outcome. In the same vein, 27.55 % of male respondents did not use instructional media in comparison to 36.67 % of female respondents who did not use instructional media in the tertiary students' conceptualization of intended learning outcomes.

Question two

What is your opinion about the necessity of using instructional media in tertiary students' conceptualization of intended learning outcomes?

Variables	**Males**	**Percentages**	**Females**	**Percentages**	**Percentage Difference**
Very necessary	68	68	38	62.30	5.7
Necessary	29	29	22	36.06	7.06
No opinion	3	3	1	1.64	1.36
Unnecessary	0	0	0	0	0
Very unnecessary	0	0	0	0	0
Total	**100**	**100**	**61**	**100**	**2.82**

Question 2 shows that there is no significant difference between the responses of male respondents visa -a -vi the female respondents at 1.36 % difference. 97 % of male respondents said instructional media was necessary and very necessary. 98.36 % of female respondents said instructional media was necessary and very necessary in tertiary students 'conceptualization of intended learning outcomes in Botswana. Both male respondents and female respondents view instructional media as necessary and very necessary in the tertiary students' conceptualization of intended learning outcomes in Botswana.

Question 3

Instructional media is relevant in the teaching and learning process at tertiary level of education. Do you agree or disagree?

Variables	**Males**	**Percentages**	**Females**	**Percentages**	**Percentage Difference**
Strongly Agree	62	62	32	52.46	9.54
Agree	38	38	28	45.90	7.9
Disagree	0	0	0	0	0
Strongly disagree	0	0	1	1.64	0.64
Total	**100**	**100**	**61**	**100**	**3.62**

100 % male respondents agree to strongly agree that instructional media is relevant at tertiary education. 98.36 % female respondents also agree to strongly agree that instructional media is relevant. The difference of 1.64 % between male respondents and female respondents is considered by the researcher as statistically insignificant for either gender to have influenced the outcomes of this question.

Question 5

To what extent do you use instructional media during the teaching and learning process, in your institution?

Variables	**Males**	**Percentages**	**Females**	**Percentages**	**Percentage Difference**
Greater extent	29	29.59	19	33.33	3.74
Lesser extent	31	31.63	16	28.07	3.56
Not sure	6	6.12	3	5.26	0.86
Not often	20	20.41	11	19.30	1.11
Rarely	12	12.24	8	14.04	1.8
Total	**98**	**100**	**57**	**100**	**2.21**

61.22% of male respondents used instructional media in teaching and learning process from lesser extent to greater extent. 61.40% of female respondents used instructional media from lesser extent to greater extent. The difference of 0.18 % is statistically insignificant for gender to have influenced the results of this question.

Question 6

How often do you use instructional media during the actual teaching and learning process?

Variables	**Males**	**Percentages**	**Females**	**Percentages**	**Percentage Difference**
Always	13	13.27	7	12.28	0.99
Very often	27	27.55	14	24.56	2.99
Not sure	3	3.06	2	3.51	0.45
Sometimes	39	39.80	26	45.61	5.81
Seldom	16	16.33	8	14.04	2.29
Total	**98**	**100**	**57**	**100**	**2.51**

40.82 % of male respondents used instructional media very often to always. 36.84% of female's respondents used instructional media very often to always during teaching and learning at tertiary level of education in Botswana. The difference in responses of males and female respondents is 3.98%. 56.13% of male respondents used sometimes to seldom instructional media during teaching and learning. Whereas 59.65% of female respondents used instructional media sometimes to seldom during teaching at tertiary level of education. The male and female responses' are similar. Therefore, gender did not influence significantly the outcomes of the above question.

Question 7

From your response in question 6 above, how many times do you actually use instructional media during teaching and learning process?

Variables	Males	Percentages	Females	Percentages	Percentage Difference
Every lecture	11	12.5	12	23.08	10.58
Once/twice a week	12	13.64	7	13.46	0.18
When appropriate	52	59.10	27	51.92	7.18
Once/twice a fortnight	5	5.68	1	1.92	3.76
Once/twice a month	8	9.10	5	9.62	0.52
Total	**88**	**100**	**52**	**100**	**4.44**

100% male respondents and 100% female respondents used instructional media always to once/twice a month. However, the bulk of respondents used instructional media when appropriate as follows: 59.10% of male respondents and 51.92% of female respondents. Gender has no significant impact on the overall use of instructional media at tertiary level of education because the views of the respondents are the same regardless of gender.

Question 9

There are some benefits other than academic achievement associated with the use of instructional media in the teaching and learning process. Do you agree or disagree?

Variables	Males	Percentages	Females	Percentages	Percentage Difference
Strongly Agree	42	42.42	20	34.48	7.97
Agree	45	45.45	31	53.45	8.0
Not sure	8	8.08	4	6.90	1.18
Disagree	3	3.03	0	0	0
Strongly disagree	1	1.01	3	5.17	4.16
Total	**99**	**100**	**58**	**100**	**4.26**

87.87% of male respondents agree to strongly agree that there were other benefits of using instructional media at tertiary level of education in Botswana. 87.93% of female respondents agree to strongly agree that they are other benefits of using instructional media at tertiary level other than the conceptualization effect. The difference between male and female respondents is 0.06, which is statistically insignificant to influence the outcomes of this question. On the contrary, 4.04% males disagree to strongly disagree that there are other benefits of using instructional media at tertiary education. 5.17% of female respondents strongly disagree that there are other benefits of using instructional media. The difference between male respondents and female respondents who disagree of other benefits is 1.13% which cannot be attributed to influencing the outcomes of this question, since the perception and the views of the respondents are the same regardless of gender.

Question 10

In your own opinion, is there any difference(s) in academic performance among students taught using instructional media from those taught using the traditional ways?

Variables	**Males**	**Percentages**	**Females**	**Percentages**	**Percentage Difference**
There is a difference	78	78.79	50	84.75	5.96
No opinion	15	15.15	6	10.17	4.98
There is no difference	6	6.06	3	5.08	0.98
Total	**99**	**100**	**59**	**100**	**3.97**

Question 10 required that respondents indicate whether a difference existed academically between students who were taught using instructional media and those not. 78.79 % of male respondents indicated that there was a difference against 6.06 % who reported no difference. 84.75 % of female respondents reported there was a difference against 5.08 % who indicated there was no difference between students taught using instructional media and students not taught using instructional media at tertiary level of education in Botswana. There is consistence in the answering pattern

between male and female respondents. The mean difference in their responses is 3.97%, and gender has not influenced the outcomes of this question since the views are the same.

Question 11

Select a comment for your response in question 10 above.

Variables	**Males**	**Percentages**	**Females**	**Percentages**	**Percentage Difference**
Instructional media students perform better academically	68	71.58	45	78.95	7.37
Traditional instruction students perform better academically	2	2.11	1	1.75	0.36
No comment	17	17.89	4	7.02	10.87
They perform the same academically	8	8.42	7	12.28	3.86
Total	**95**	**100**	**57**	**100**	**5.62**

This question 11 required respondents to select a comment for their choice of responses in question 10 above. 71.58 % of male respondents said instructional media make students perform better academically as compared to traditional instruction. 78.95 % of female respondents reported instructional media make students perform better academically. Here male respondents and female respondents have the same view regarding instructional media; in this case gender is viewed not to influence the results of this question.

Question 12

In your opinion, what would you suggest as the average percentage gain of students taught with instructional media against the students taught using traditional ways in their academic performance?

Variables	Males	Percentages	Females	Percentages	Percentage
50% more or better	48	52.75	40	72.73	19.98
30%-49% better	22	24.18	9	16.36	7.82
10% -29% better	13	14.29	3	5.45	8.84
1% -9% better	8	8.79	3	5.45	3.34
Total	**91**	**100**	**55**	**100**	**9.96**

This question required the respondents to estimate the academic gain of using instructional media at tertiary level of education in Botswana. 100% of male respondents indicated the gain between 1% to 50% more or better. 100% female respondents reported the same as their male counterparts. Although alternatives have different estimated percentile gains, however the pattern seems to be the same for example from 10% gain and above, 91.21 % of male respondents reported that academic gain, while 94.55 % of female respondents said of the same academic gain.

The views of males and females are similar for this question hence gender did not influence the outcome of question 12.

Question 14

Is there any relationship between instructional media and tertiary students' conceptualization of intended learning outcomes?

Variables	Males	Percentages	Females	Percentages	Percentage Difference
Yes	62	65.26	34	59.65	5.61
Somehow yes	21	22.11	17	29.82	7.71
I do not know	8	8.42	5	8.8	0.38
Somehow No	1	1.05	0	0	0
No	3	3.16	1	1.75	1.41
Total	**95**	**100**	**57**	**100**	**3.02**

This question 14 required that respondents indicate whether a difference existed academically or not between students who were taught using instructional media and those who were taught using traditional instructional ways. 87.37 % of male respondents reported somehow yes to yes against 4.21 % who said somehow no to no. 89.47 % of female respondents indicated somehow yes to yes against 1.75 % who reported somehow no to no. The results between male respondents and female respondents show a similar pattern with a mean difference of 3.02%. There is consistence between the male views and the female views and therefore gender has no impact on these results.

Question 15

How would you describe the relationship you have identified in question 14 above in terms of tertiary students' conceptualization of intended learning outcomes?

Variables	**Males**	**Percentages**	**Females**	**Percentages**	**Percentage Difference**
Positive	55	58.51	32	58.18	0.33
Somehow positive	26	27.66	14	25.45	2.21
Not sure	10	10.64	9	16.36	5.72
Somehow negative	3	3.19	0	0	0
Negative	0	0	0	0	0
Total	**94**	**100**	**55**		**1.65**

Question 15 required that respondents to characterize the type of relationship indicated in question 14 above with reference to tertiary students' conceptualization of intended learning outcomes. 86.17 % of male respondents said the relationship was somehow positive to positive against 3.19 % of male respondents who reported the relationship between tertiary students' conceptualization of intended learning outcomes as somehow negative. 83.63% of female respondents showed the relationship between instructional media and tertiary students' conceptualization of intended learning outcomes as somehow positive to positive against 0% on somehow negative to negative. The mean

difference is 1.65 %. The views of respondents on this question are closely similar and therefore no gender played any significant role on the results of his question.

Question 16

How do you rate your description of the relationship which you identified in question 15 above, in terms of tertiary students' conceptualization of intended learning outcomes?

Variables	**Males**	**Percentages**	**Females**	**Percentages**	**Percentage Difference**
Very strong	28	29.79	12	21.43	8.36
Strong	52	55.32	31	55.36	0.04
No opinion	11	11.70	11	19.64	7.94
Weak	2	2.13	1	1.79	0.34
Very weak	1	1.06	1	1.79	0.73
Total	**94**	**100**	**56**	**100**	**3.5**

Question 16 required that respondents describe the strength of their response in question 15 above. 85.11 % of male respondents showed the relationship between instructional media and tertiary students' conceptualization of intended learning outcomes to be strong to very strong relationship against 3.19 % of male respondents who showed weak to very weak relationship. 76.79 % of female respondents reported strong to very strong relationship against 3.58 % of the female respondents who reported weak to very weak relationship**.** The mean difference is 3.5%. There is a similar pattern between male respondents and female respondents' description of the relationship between instructional media and tertiary students' conceptualization of intended learning outcomes in Botswana; hence no gender had influence to this question.

Question 18

How much roughly do you spend annually on purchasing and maintenance of instructional media?

Variables	Males	Percentages	Females	Percentages	Percentage Difference
Less than P200 000	47	73.44	24	75.00	1.56
P200 000-P400 000	12	18.75	6	18.75	0
P400 000-P600 000	2	3.13	1	3.13	0
P600 000-P800 000	0	0	0	0	0
P800000-P1000000	3	4.69	1	3.13	1.56
Total	**64**	**100**	**32**	**100**	**0.62**

This question required that respondents indicate a rough estimate of the amount in monetary terms they used to purchase and maintain instructional media either as a department, faculty or institution annually. The results between male and female respondents are almost identical. There is a mean difference of 0.65 % between male and female respondents which is considered statistically insignificant. Therefore, no gender had more influence over the other in this question.

Question 19

In your opinion, evaluate the usage of your chosen amount in question 18. The money is...

Variables	Males	Percentages	Females	Percentages	Percentage Difference
Put to very good use	9	12.68	8	24.24	11.56
Put to good use	33	46.48	13	39.39	7.09
I do not know	19	26.76	9	27.27	0.51
Put not to good use	7	9.86	3	9.09	0.77
Put not to very good use	3	4.23	0	0	0
Total	**71**	**100**	**33**	**100**	**3.99**

Question 19 required respondents to value judge the use of the amount indicated in question 18 above. 59.16 % of male respondents reported the money was put to good use and to very good use against 14.09 % of males who reported that the money was not put to good use and not very good use. 63.63 % of female respondents showed the money were put to good use and to very good use against 9.09 % of females who said the money was not put to good use and not put to very good use. Both male and female respondents agree that the money used to purchase and maintain instructional media is generally used for a good cause; therefore no gender influenced the outcomes of this question.

Question 20

Which instructional media do you frequently use in your institution/when you teach?

Variables	**Males**	**Percentages**	**Females**	**Percentages**	**Percentage Difference**
Computers &accessories	46	50	12	24.49	25.51
Models	8	8.70	2	4.08	4.62
Charts& other illustrations	17	18.48	7	14.29	4.19
Combinations of the above	21	22.83	28	57.14	34.31
Total	**92**	**100**	**49**	**100**	**17.16**

Question 20 required respondents to indicate which instructional media were frequently used in their institutions when they teach. 72.83 % of male respondents indicated computers and their accessories followed by a combination of instructional media. 81.63 % of female respondents reported combinations of instructional media followed by computers and their accessories. 27.18 % of male respondents used models and charts. 18.37 % of female respondents used models and charts. The results are similar, the respondents frequently used computers and a combination of instructional media,

therefore no gender influenced the use of instructional media at tertiary level of education in Botswana.

Question 21

Why do you frequently use the instructional media mentioned in question 20 above?

Variables	**Males**	**Percentages**	**Females**	**Percentages**	**Percentage Difference**
Very cheap	7	8.64	2	4.44	4.2
Easy to use	34	41.98	17	37.78	4.2
Just available	28	34.57	14	31.11	3.46
Organizational culture	9	11.11	4	8.89	2.22
No reason	3	3.70	8	17.78	14.08
Total	**81**	**100**	**45**	**100**	**5.63**

This question required the respondents to justify why they frequently used the instructional media which the respondents mentioned in question 20 above. 76.55% of male respondents reported easy to use and just available as reasons why they frequently used that instructional media. 68.89% of female respondents said the reason to frequently use the instructional media were easy to use and just available in the institution. The pattern of responses are very identical; male respondents have ordered the reasons, easy to use (41.98%), just available (34.57%), organizational culture (11.11%) and very cheap (8.64%). Female respondents order the reasons in the same order easy to use (37.78%), Just available (31.11%), organizational culture (8.89%) and very cheap (4.44%). Gender had no influence on the responses to this question.

4.12.1.1 Conclusion to gender variable

The purpose was to find out whether gender (male respondents or female respondents) influenced the overall results of this study, since gender, age, educational background(qualifications) are some of the factors that are considered to influence individual perception*(For gender see section 4.7.2 and table 4.1).* The seventeen closed

ended questions were analyzed from both male and female respondents, showed consistence of perception in male and female responses to questions. There is no evidence to suggest that either of the gender influenced singly the responses to the questions answered. In this study it is concluded that gender had no influence to the overall results of this study *(see results presented in tables 4.10 to 4.33)* of this study. This is contrary to the findings of Koksal, Yaman and Saka (2016), when they carried a study to analyze Turkish Prospective Science Teachers' perceptions on Technology in Education. Their main research question was "Is there any statistically significant difference in the perception scores of the pre-service science teachers toward educational technology in terms of gender, learning styles, computer competency level and possession of a computer?" Koksal et al (2016:33), concluded that, "The main effect pointed out that the male pre-service science teachers had more positive perceptions about instructional technology than the female pre-service science teachers did. Furthermore, the interaction effect pointed out that the male pre-service science teachers who were weak in computer competency had more positive perceptions about instructional technology than the female pre-service science teachers who were weak in computer competency." However, they went on to say that based on the results of their study, it is evident that the perception of Turkish pre service science teachers who participated in this study about educational technology is positive in general (Koksal et al 2016:34). Here to a larger extent, their conclusion is consistent with the findings of this study since this study does not focus on score (percentages), but the perceptions associated with the percentages and therefore, from gender perspective of this study, the gender variable had no significant differences in general perceptions to responses given to questions from the questionnaire; as a result the findings of this study are not gender biased in perception and therefore are considered consistent and reliable.

4.12.2 The age's variable

The chronological ages of respondents are referred to in table 4.35. Age is associated with a certain level of mental development, making informed judgments, wisdom and reasoning.

Table 4.35: Responses by the respondents' age variable

Questions & Variables	25-30 years	Percent	31-40 years	Percent	41-50 years	percent	51-65 years	Percent
Question 1								
Yes	15	57.69	61	73.50	35	77.78	10	71.43
No	11	42.31	22	26.51	10	22.22	4	28.57
Total	**26**	**100**	**83**	**100**	**45**	**100**	**14**	**100**
Question 2								
Very necessary	14	53.85	56	67.47	30	62.5	7	50.00
Necessary	10	38.46	25	30.12	17	35.42	7	50.00
No opinion	2	7.69	2	2.41	0	0	0	0
Unnecessary	0	0	0	0	1	2.08	0	0
Very unnecessary	0	0	0	0	0	0	0	0
Total	**26**	**100**	**83**	**100**	**48**	**100**	**14**	**100**
Question 3								
Strongly Agree	13	50.00	52	63.41	26	53.06	10	71.43
Agree	13	50.00	30	36.59	21	42.86	4	28.57
Disagree	0	0	0	0	1	2.04	0	0
Strongly disagree	0	0	0	0	1	2.04	0	0
Total	**26**	**100**	**82**	**100**	**49**	**100**	**14**	**100**
Question 5								
Greater extent	5	20.83	25	30.12	19	40.43	3	21.43
Lesser extent	5	20.83	28	33.73	14	29.79	7	50.00
Not sure	1	4.17	4	4.82	3	6.38	1	7.14
Not often	8	33.33	12	14.46	7	14.89	3	21.43
Rarely	5	20.83	14	16.87	4	8.51	0	0

Total	**24**	**100**	**83**	**100**	**47**	**100**	**14**	**100**
Question 6								
Always	1	4.17	9	10.98	11	24.44	0	0
Very often	6	25.00	20	24.39	9	20.00	6	46.15
Not sure	2	8.33	2	2.43	2	4.44	1	7.69
Sometimes	7	29.17	41	50.00	20	44.44	5	38.46
Seldom	8	33.33	10	12.20	3	6.67	1	7.69
Total	**24**	**100**	**82**	**100**	**45**	**100**	**13**	**100**
Question 7								
Every lecture	2	9.52	12	16.22	9	20.00	0	0
Once/twice a week	4	19.04	12	16.22	3	6.67	2	16.67
When appropriate	13	61.90	44	59.46	22	48.89	9	75.00
Once/twice a fortnight	0	0	1	1.35	2	4.44	1	8.33
Once/twice a month	2	9.52	5	6.76	9	20.00	0	0
Total	**21**	**100**	**74**	**100**	**45**	**100**	**12**	**100**
Question 9								
Strongly agree	10	40.00	33	40.74	17	36.96	5	35.71
Agree	11	44.00	42	51.85	24	52.17	8	57.14
Not sure	3	12.00	5	6.17	2	4.35	1	7.14
Disagree	1	4	0	0	1	2.17	0	0
Strongly disagree	0	0	1	1.23	2	4.35	0	0
Total	**25**	**100**	**81**	**100**	**46**	**100**	**14**	**100**
Question 10								
There is a difference	18	72.00	71	87.65	34	72.34	12	85.71

No opinion	5	20.00	7	8.64	9	19.15	2	14.29
There is no difference	2	8.00	3	3.70	4	8.51	0	0
Total	**25**	**100**	**81**	**100**	**47**	**100**	**14**	**100**
Question 11								
Instructional media students perform better academically	15	60.00	62	76.54	28	60.87	11	84.62
Traditional instruction students perform better academically	2	8.00	2	2.47	1	2.17	0	0
No comment	5	20.00	12	14.81	11	23.91	2	15.38
They perform the same academically	3	12.00	5	6.17	6	13.04	0	0
Total	**25**	**100**	**81**	**100**	**46**	**100**	**13**	**100**
Question 12								
50% more or better	10	40.00	50	65.79	26	66.67	8	61.54
30%-49% better	7	28.00	13	17.11	9	23.08	4	30.77
10% -29% better	4	16.00	11	14.47	2	5.13	1	7.69
1% -9% better	4	16.00	2	2.63	2	5.13	0	0
Total	**25**	**100**	**76**	**100**	**39**	**100**	**13**	**100**
Question 14								

Yes	13	54.17	52	65.00	26		7	53.85
Somehow yes	10	41.67	18	22.50	11		4	30.77
I do not know	1	4.17	7	8.75	7		2	15.38
Somehow No	0	0	1	1.25	1		0	0
No	0	0	2	2.50	**2**		0	0
Total	**24**	**100**	**80**	**100**	**47**		**13**	**100**
Question 15								
Positive	8	34.78	48	61.54	29	63.04	8	61.54
Somehow positive	10	43.48	20	25.64	7	15.22	3	23.08
Not sure	4	17.39	7	8.97	8	17.39	2	15.38
Somehow negative	1	4.35	2	2.56	2	4.35	0	0
Negative	0	0	1	1.28	0	0	0	0
Total	**23**	**100**	**78**	**100**	**46**	**100**	**13**	**100**
Question 16								
Very strong	4	16.67	20	26.32	9	19.57	6	46.15
Strong	14	58.33	44	57.89	26	56.52	5	38.46
No opinion	4	16.67	8	10.53	9	19.57	2	15.38
Weak	1	4.17	3	3.95	2	4.35	0	0
Very weak	1	4.17	1	1.32	0	0	0	0
Total	**24**	**100**	**76**	**100**	**46**	**100**	**13**	**100**
Question 18								
Less than P200 000	13	86.67	38	62.30	18	56.25	6	85.71
P200 000-P400 000	1	6.67	9	14.75	10	31.25	1	14.29
P400 000-P600 000	0	0	3	4.92	0	0	0	0
P600 000-	0	0	0	0	0	0	0	0

P800 000								
P800000-P1000000	1	6.67	11	18.03	4	12.5	0	0
Total	**15**	**100**	**61**	**100**	**32**	**100**	**7**	**100**
Question 19								
Put to very good use	1	6.25	13	21.67	7	22.58	1	11.11
Put to good use	3	18.75	22	36.67	14	45.16	5	55.56
I do not know	9	56.25	17	28.33	6	19.35	2	22.22
Put not to good use	3	18.75	6	10.00	2	6.45	1	11.11
Put not to very good use	0	0	2	3.33	2	6.45	0	0
Total	**16**	**100**	**60**	**100**	**31**	**100**	**9**	**100**
Question 20								
Computers &accessories	9	45.00	32	41.03	15	34.09	7	53.85
Models	1	5.00	4	5.13	8	18.18	0	0
Charts& other illustrations	4	20.00	20	25.64	6	13.64	2	15.38
Combinations of the above	6	30.00	22	28.21	15	34.09	4	30.77
Total	**20**	**100**	**78**	**100**	**44**	**100**	**13**	**100**
Question 21								
Very cheap	1	5.56	3	4.48	3	7.69	0	0
Easy to use	6	33.33	25	37.31	13	33.33	6	46.15
Just available	8	44.44	23	34.32	14	35.90	5	38.46
Organizational culture	2	11.11	12	17.91	7	17.95	1	7.69

No reason	1	5.56	4	5.97	2	5.13	1	7.69
Total	**18**	**100**	**67**	**100**	**39**	**100**	**13**	**100**

The above table 4.35 shows the responses by respondents in the respective groups of their chronological ages. These biological ages of respondents were grouped in to four categories as follows: 25-30 years, 31-40 years, 41-50 years and 51-65 years. The age groups were important to this study since age is considered one of those biological factors that influence perception of individuals. Generally the age range from 25 years to 65 years old was felt to be good enough to make mature, wise and informed decision on the individual respondent's perception. The results in table 4.35 above shows that all age groups had the same perceptions to each question for instance in question one, the majority of the respondents in each age category used instructional media as opposed to the minority respondents who did not use instructional media, for example the following percentages are arranged following the different age groupings as follows; 57.69, 73.50, 77.78 and 71.43 respectively. Therefore ages have no significant effect on the responses given by different age groups. There are similarities in all questions for instance questions 2, 3, 4, 5 have similar views, In short all the seventeen questions used to check reliability of the results of this study under the ages variable, the responses are similar in terms of the general view of each question and therefore, age variable did not pose an effect to the reliability of the overall results and findings of this study.

4.12.2.1 Conclusion to the age's variable

The purpose of this analysis was to find if the biological age of the respondents influenced the respondents to select certain responses unique to a specific age group in this study. Results from analysis of this variable (age) indicate that age of the respondents did not have significant influence on their choice of responses. Therefore it was concluded that for this study, biological ages of the respondents did not have any significant effect upon the overall results and findings of this study, in the realm of this variable the results are reliable.

4.12.3 The highest qualification variable

Different levels of educational programmes in Botswana require different levels of qualifications; from certificate programmes to post graduate degree programmes. The highest qualification is what the respondents held as “the biggest” at that time when the research was carried in their institutions.

Table 4.36: Responses by the respondents’ highest qualification

Questions &variables	**Dip**	**%**	**ADip**	**%**	**BAC**	**%**	**HON**	**%**	**Ma**	**%**
Question 1										
Yes	33	63.46	20	71.43	21	72.41	10	66.67	29	90.63
No	19	36.54	8	28.57	8	27.59	5	33.33	3	9.37
Total	**52**	**100**	**28**	**100**	**29**	**100**	**15**	**100**	**32**	**100**
Question 2										
Very necessary	33	60.00	15	51.72	19	63.33	12	80.00	25	78.13
Necessary	21	38.18	12	41.38	11	36.67	2	13.33	7	21.86
No opinion	1	1.81	1	3.45	0	0	1	6.67	0	0
Unnecessary	0	0	1	3.45	0	0	0	0	0	0
Very unnecessary	0	0	0	0	0	0	0	0	0	0
Total	**55**	**100**	**29**	**100**	**30**	**100**	**15**	**100**	**32**	**100**
Question 3										
Strongly Agree	27	49.09	15	51.72	19	63.33	10	66.67	25	78.13
Agree	27	49.09	13	44.83	11	36.67	5	33.33	7	21.88
Disagree	0	0	1	3.45	0	0	0	0	0	0
Strongly disagree	1	1.81	0	0	0	0	0	0	0	0
Total	**55**	**100**	**29**	**100**	**30**	**100**	**15**	**100**	**32**	**100**
Question 5										

Greater extent	16	29.63	7	25.00	9	31.03	5	35.71	12	37.50
Lesser extent	17	31.48	13	46.43	11	37.93	3	21.43	11	34.38
Not sure	1	1.85	1	3.57	1	3.45	2	14.29	2	6.25
Not often	9	16.67	5	17.86	5	17.24	1	7.14	5	15.63
Rarely	11	20.37	2	7.14	3	10.34	3	21.43	2	6.25
Total	**54**	**100**	**28**	**100**	**29**	**100**	**14**	**100**	**32**	**100**
Question 6										
Always	5	9.43	2	7.14	5	17.24	4	28.57	6	20.00
Very often	9	16.98	12	42.86	8	27.59	2	14.29	9	30.00
Not sure	2	3.77	1	3.57	1	3.45	1	7.14	0	0
Sometimes	25	47.17	12	42.86	13	44.83	3	21.43	14	46.67
Seldom	12	22.64	1	3.57	2	6.90	4	28.57	1	3.33
Total	**53**	**100**	**28**	**100**	**29**	**100**	**14**	**100**	**30**	**100**
Question 7										
Every lecture	6	12.50	4	14.81	5	17.86	4	30.77	5	16.13
Once/twice a week	6	12.50	6	22.22	1	3.57	2	15.38	8	25.81
When appropriate	26	54.17	13	48.15	20	71.43	6	46.15	15	48.39
Once/twice a fortnight	1	2.08	1	3.70	0	0	0	0	2	6.45
Once/twice a month	9	18.75	3	11.11	2	7.14	1	7.69	1	3.23
Total	**48**	**100**	**27**	**100**	**28**	**100**	**13**	**100**	**31**	**100**
Question 9										
Strongly agree	19	34.55	10	34.48	10	34.48	7	46.67	18	58.06
Agree	29	52.73	16	55.17	15	51.72	5	33.33	13	41.94

Not sure	3	5.45	3	10.34	2	6.90	3	20.00	0	0
Disagree	2	3.64	0	0	1	3.45	0	0	0	0
Strongly disagree	2	3.64	0	0	1	3.45	0	0	0	0
Total	**55**	**100**	**29**	**100**	**29**	**100**	**15**	**100**	**31**	**100**
Question 10										
There is a difference	45	81.81	25	86.21	24	82.76	13	92.86	25	78.13
No opinion	6	10.91	4	13.79	2	6.90	1	7.14	6	18.75
There is no difference	4	7.27	0	0	3	10.34	0	0	1	3.13
Total	**55**	**100**	**29**	**100**	**29**	**100**	**14**	**100**	**32**	**100**
Question 11										
Instructional media students perform better academically	40	76.92	22	75.86	23	76.67	10	66.67	22	73.33
Traditional instruction students perform better academically	1	1.92	2	6.90	1	3.33	0	0	1	3.33
No comment	6	11.54	4	13.79	4	13.33	4	26.67	6	20.00
They perform the same academically	5	9.62	1	3.45	2	6.67	1	6.67	1	3.33

Total	**52**	**100**	**29**	**100**	**30**	**100**	**15**	**100**	**30**	**100**
Question 12										
50% more or better	35	71.43	18	62.06	14	51.85	8	53.33	16	59.26
30%-49% better	8	16.33	7	24.14	7	25.93	3	20.00	7	25.93
10% -29% better	3	6.12	4	13.79	4	14.81	3	20.00	2	7.41
1% -9% better	3	6.12	0	0	2	7.41	1	6.67	2	7.41
Total	**49**	**100**	**29**	**100**	**27**	**100**	**15**	**100**	**27**	**100**
Question 14										
Yes	33	63.46	19	65.52	15	50.00	9	60.00	20	66.67
Somehow yes	10	19.23	8	27.59	10	33.33	5	33.33	5	16.67
I do not know	4	7.69	1	3.45	4	13.33	1	6.67	5	16.67
Somehow No	2	3.85	1	3.45	0	0	0	0	0	0
No	3	5.77	0	0	1	3.33	0	0	0	0
Total	**52**	**100**	**29**	**100**	**30**	**100**	**15**	**100**	**30**	**100**
Question 15										
Positive	30	57.69	21	75.00	10	33.33	9	64.29	20	68.97
Somehow positive	11	21.15	6	21.43	14	46.67	3	21.43	4	13.79
Not sure	7	13.46	1	3.57	5	16.67	2	14.29	5	17.24
Somehow negative	4	7.69	0	0	0	0	0	0	0	0
Negative	0	0	0	0	1	3.33	0	0	0	0
Total	**52**	**100**	**28**	**100**	**30**	**100**	**14**	**100**	**29**	**100**

Question 16										
Very strong	14	28.00	9	33.33	1	3.33	5	33.33	14	46.67
Strong	24	48.00	16	59.26	24	80.00	8	53.33	10	33.33
No opinion	6	12.00	1	3.70	4	13.33	0	0	6	20.00
Weak	5	10.00	1	3.70	0	0	2	13.33	0	0
Very weak	1	2.00	0	0	1	3.33	0	0	0	0
Total	**50**	**100**	**27**	**100**	**30**	**100**	**15**	**100**	**30**	**100**
Question 18										
Less than P200 000	21	72.41	17	77.27	16	66.67	8	80.00	12	66.67
P200 000-P400 000	7	24.14	4	18.18	5	20.83	1	10.00	4	22.22
P400 000-P600 000	0	0	1	4.55	3	12.5	0	0	0	0
P600 000-P800 000	0	0	0	0	0	0	0	0	0	0
P800000-P1000000	1	3.45	0	0	0	0	1	10.00	2	11.11
Total	**29**	**100**	**22**	**100**	**24**	**100**	**10**	**100**	**18**	**100**
Question 19										
Put to very good use	5	14.29	4	20.00	5	21.74	4	36.36	6	26.09
,35Put to good use	13	37.14	10	50.00	12	52.17	3	27.27	8	34.78
I do not know	11	31.43	5	25.00	5	21.74	2	18.18	7	30.43
Put not to good use	6	17.14	1	5.00	0	0	2	18.18	1	4.35
Put not to very good	0	0	0	0	1	4.35	0	0	1	4.35

use										
Total	**35**	**100**	**20**	**100**	**23**	**100**	**11**	**100**	**23**	**100**
Question 20										
Computers &accessories	16	34.78	8	32.00	16	55.17	5	41.67	19	61.29
Models	9	19.57	4	16.00	0	0	0	0	0	0
Charts& other illustrations	10	21.74	3	12.00	4	13.79	2	16.67	4	12.90
Combinations of the above	11	23.91	10	40.00	9	31.03	5	41.67	8	25.81
Total	**46**	**100**	**25**	**100**	**29**	**100**	**12**	**100**	**31**	**100**
Question 21										
Very cheap	5	11.90	1	4.17	4	14.29	0	0	0	0
Easy to use	13	30.95	8	33.33	11	39.29	4	33.33	14	51.85
Just available	12	28.57	11	45.83	10	35.71	4	33.33	7	25.93
Organizational culture	6	14.29	4	16.67	3	10.71	4	33.33	4	14.81
No reason	6	14.29	0	0	0	0	0	0	2	7.41
Total	**42**	**100**	**24**	**100**	**28**	**100**	**12**	**100**	**27**	**100**

The highest qualification variable was included in this study, the rationale being that different qualifications bring about different types of knowledge and different knowledge levels; hence the qualification might have an effect on the final result of this study. The groupings by qualification were; diploma, advanced/higher diploma, bachelor's degree Honors' degree and master degree. Table 4.36 above shows that different qualifications had no significant effect on the results for example in question 2, the diploma respondents indicated 98.18 % considered instructional media necessary to very

necessary, Advanced diploma group 93.1 % of respondents agreed that instructional media were necessary to very necessary in the teaching and learning at tertiary education in Botswana. 100 % of respondents holding bachelor's degrees reported instructional media were necessary to very necessary. 93.33 % respondents with Honors degree said instructional media were necessary to very necessary at tertiary level of education in the conceptualization of intended learning outcomes in Botswana. All the seventeen questions show that differences in qualifications did not influence the respondents' views about the questions.

4.12.3.1 Conclusion to the highest qualification variable

It was found out that for this study, qualifications of respondents did not have any influence towards the selection of their responses and ultimately the view of respondents upon a given question of this study. It is concluded that for this study qualifications do not impact on the respondents'' perception and views about instructional media and tertiary students conceptualization of intended learning outcomes. From the perspective of highest qualification variable, the final results and findings of this study are consistent with respondents' general view indicated in the study and therefore are considered reliable results.

4.12.4 The years of experience variable

It is an important aspect that is regarded with high esteem in educational setups. Teaching experience is seen as a doorway to students' academic achievement, and students' conceptualization of intended learning outcomes. Teaching experience is associated with knowing the "how's and what's" of teaching and assessing learners.

Table 4.37: Responses by the respondents' years of teaching experience variable

Questions& variables	**1-5 yrs.**	**%**	**6-10 yrs.**	**%**	**11-20 yrs.**	**%**	**21-30 yrs.**	**%**	**31+ yrs.**	**%**
Question 1										
Yes	29	63.04	30	71.43	44	77.19	14	82.35	3	75.00
No	17	36.96	12	28.57	13	22.81	3	17.65	1	25.00
Total	**46**	**100**	**42**	**100**	**57**	**100**	**17**	**100**	**4**	**100**

Question2										
Very necessary	31	67.39	28	66.67	39	65.00	11	64.71	3	75.00
Necessary	13	28.26	13	30.95	19	31.67	6	35.29	1	25.00
No opinion	2	4.35	0	0	2	3.33	0	0	0	0
Unnecessary	0	0	1	2.38	0	0	0	0	0	0
Very unnecessary	0	0	0	0	0	0	0	0	0	0
Total	**46**	**100**	**42**	**100**	**60**	**100**	**17**	**100**	**4**	**100**
Question 3										
Strongly Agree	25	54.35	23	54.76	34	56.67	11	64.71	3	100
Agree	21	45.65	18	42.86	25	41.67	6	35.29	0	0
Disagree	0	0	1	2.38	0	0	0	0	0	0
Strongly disagree	0	0	0	0	1	1.67	0	0	0	0
Total	**46**	**100**	**42**	**100**	**60**	**100**	**17**	**100**	**3**	**100**
Question 5										
Greater extent	13	28.89	11	26.19	20	34.48	6	35.29	2	50.00
Lesser extent	10	22.22	17	40.48	17	29.31	7	41.18	1	25.00
Not sure	1	2.22	1	2.38	5	8.62	2	11.76	0	0
Not often	13	28.89	7	16.67	8	13.79	2	11.76	1	25.00
Rarely	8	17.78	6	14.29	8	13.79	0	0	0	0
Total	**45**	**100**	**42**	**100**	**58**	**100**	**17**	**100**	**4**	**100**
Question 6										
Always	5	11.11	6	14.29	9	16.07	4	25.00	0	0
Very often	11	24.44	9	21.43	13	23.21	3	18.75	2	50.00
Not sure	2	4.44	1	2.38	3	5.36	1	6.25	0	0

Sometimes	15	33.33	21	50.00	28	50.00	6	37.5	2	50.00
Seldom	12	26.67	5	11.90	3	5.36	2	12.5	0	0
Total	**45**	**100**	**42**	**100**	**56**	**100**	**16**	**100**	**4**	**100**
Question 7										
Every lecture	5	17.24	7	17.95	11	19.64	2	13.33	0	0
Once/twice a week	7	24.14	4	10.26	7	12.5	1	6.67	2	50.00
When appropriate	16	55.17	22	56.41	30	53.57	10	66.67	1	25.00
Once/twice a fortnight	0	0	1	2.56	1	1.79	1	6.67	1	25.00
Once/twice a month	1	3.45	5	12.82	7	12.5	1	6.67	0	0
Total	**29**	**100**	**39**	**100**	**56**	**100**	**15**	**100**	**4**	**100**
Question 9										
Strongly agree	14	40.00	14	35.00	24	41.38	6	35.29	2	40.00
Agree	15	42.86	21	52.5	30	51.72	10	58.82	3	60.00
Not sure	3	8.57	4	10.00	3	5.17	0	0	0	0
Disagree	2	5.71	0	0	0	0	1	5.88	0	0
Strongly disagree	1	2.86	1	2.5	1	1.72	0	0	0	0
Total	**35**	**100**	**40**	**100**	**58**	**100**	**17**	**100**	**5**	**100**
Question 10										
There is a difference	25	75.76	35	87.5	47	82.46	14	82.35	3	75.00
No opinion	5	15.15	4	10.00	7	12.28	2	11.76	1	25.00
There is no difference	3	9.09	1	2.5	3	5.26	1	5.88	0	0
Total	**33**	**100**	**40**	**100**	**57**	**100**	**17**	**100**	**4**	**100**

Question 11										
Instructional media students perform better academically	24	68.57	32	78.05	38	70.37	13	76.47	0	0
Traditional instruction students perform better academically	0	0	1	2.44	4	7.41	0	0	0	0
No comment	6	17.14	5	12.20	9	16.67	4	23.53	0	0
They perform the same academically	5	14.29	3	7.32	3	5.56	0	0	0	0
Total	**35**	**100**	**41**	**100**	**54**	**100**	**17**	**100**	**0**	**0**
Question 12										
50% more or better	21	55.26	24	63.16	34	66.67	11	78.57	4	80.00
30%-49% better	10	26.32	6	15.79	12	23.53	1	7.14	1	20.00
10% -29% better	5	13.16	8	21.05	2	3.93	1	7.14	0	0
1% -9% better	2	5.26	0	0	3	5.88	1	7.14	0	0
Total	**38**	**100**	**38**	**100**	**51**	**100**	**14**	**100**	**5**	**100**
Question 14										

Yes	26	59.09	26	61.90	35	62.5	8	47.06	4	80.00
Somehow yes	14	31.82	9	21.43	14	25.00	5	29.41	1	20.00
I do not know	3	6.82	6	14.29	6	10.71	1	5.88	0	0
Somehow No	0	0	0	0	1	1.79	1	5.88	0	0
No	1	2.27	1	2.38	0	0	2	11.76	0	0
Total	**44**	**100**	**42**	**100**	**56**	**100**	**17**	**100**	**5**	**100**
Question 15										
Positive	21	48.84	23	57.5	36	64.29	11	64.71	4	80
Somehow positive	14	32.56	10	25.00	12	21.43	3	17.65	1	20
Not sure	6	13.95	5	12.5	7	12.5	2	11.76	0	0
Somehow negative	1	2.33	2	5.00	1	1.79	1	5.88	0	0
Negative	1	2.33	0	0	0	0	0	0	0	0
Total	**43**	**100**	**40**	**100**	**56**	**100**	**17**	**100**	**5**	**100**
Question 16										
Very strong	12	28.57	12	30.00	11	19.64	5	29.41	3	60.00
Strong	22	52.38	20	50.00	35	62.5	7	41.18	2	40.00
No opinion	5	11.90	6	15.00	8	14.29	4	23.53	0	0
Weak	1	2.38	2	5.00	2	3.57	1	5.88	0	0
Very weak	2	4.76	0	0	0	0	0	0	0	0
Total	**42**	**100**	**40**	**100**	**56**	**100**	**17**	**100**	**5**	**100**
Question 18										
Less than P200 000	24	72.73	20	76.92	26	59.09	11	91.67	2	66.67
P200 000-P400 0000	5	15.15	5	19.23	11	25.00	0	0	1	33.33

P4000 000-P600 0000	2	6.06	1	3.85	1	2.27	0	0	0	0
P60016 000-P800 000	0	0	0	0	0	0	0	0	0	0
P800000-P1000000	2	6.06	0	0	1	2.27	1	8.33	0	0
Total	**33**	**100**	**26**	**100**	**44**	**100**	**12**	**100**	**3**	**100**
Question 19										
Put to very good use	7	19.44	7	21.88	8	18.18	3	27.27	0	0
Put to good use	10	27.78	12	37.5	19	43.18	4	36.36	3	100
I do not know	13	36.11	8	25.00	9	20.45	2	18.18	0	0
Put not to good use	5	13.89	5	15.63	2	4.55	1	9.09	0	0
Put not to very good use	1	2.78	0	0	1	2.27	1	9.09	0	0
Total	**36**	**100**	**32**	**100**	**44**	**100**	**11**	**100**	**3**	**100**
Question 20										
Computers &accessories	17	40.48	16	38.10	19	35.85	8	53.33	2	66.67
Models	2	4.76	4	9.52	8	15.09	0	0	0	0
Charts& other illustrations	12	28.57	7	17.95	7	13.21	3	20.00	0	0
Combinations of the	11	26.19	12	30.77	19	35.85	4	26.67	1	33.33

above										
Total	**42**	**100**	**39**	**100**	**53**	**100**	**15**	**100**	**3**	**100**
Question 21										
Very cheap	4	9.76	3	8.57	2	4.65	1	7.14	2	50.00
Easy to use	17	41.46	9	25.71	19	48.19	8	57.14	2	50.00
Just available	15	36.59	11	31.43	10	23.26	4	28.57	0	0
Organizational culture	4	9.77	10	28.57	9	20.93	1	7.14	0	0
No reason	1	2.44	2	5.71	3	6.98	0	0	0	0
Total	**41**	**100**	**35**	**100**	**43**	**100**	**14**	**100**	**4**	**100**

The teaching experience variable was included in this study because experience is one of those factors that exert influence upon an individual's perception. Basically teaching experience refers to the number of years the respondents have been exposed to instruction in this case at tertiary level of education. Five groups of teaching experience at tertiary level of education were identified as follows;1-5 years, 6-10 years , 11-20 years, 21-30 years and finally 31 years and above. Table 4.37 shows there is consistence in the responses between different respondents with different teaching experiences. For example, question 9 shows 82.86 % of respondents in the 1-5 years' experience indicated they were other benefits of using instructional media during teaching and learning at tertiary education other than the conceptualization effect. 87.5 % of the 6-10 year experienced respondents reported that they were other benefits of using instructional media. 93.1% of the 11-20 years of experience indicated other benefits of using instructional media at tertiary education. The 21-30 years of experience had 94.17 % of the respondents reporting other benefits of using instructional media at tertiary level of education in Botswana. The 31 above years of experience showed that 100 % of the respondents indicated other benefits when using instructional media at tertiary level of education. Responses in table 4.37 show a consistent pattern of answering the questions from different years of experience; therefore, experience did not influence the final result of this study.

4.12.4.1 Conclusion to the years of experience variable

The analysis of this variable showed years of teaching experience at tertiary level of education did not impact on the results and findings of this study. It was therefore concluded by the researcher that the number of years of experience in teaching at tertiary education in Botswana do not influence the perception and views of respondents' in their choice of responses, about instructional media and tertiary students' conceptualization of intended learning outcomes. In the same vein of the experience variable, the results of this study are consistent with the views of tertiary educators in Botswana; hence they are considered reliable result.

4.12.5 The position currently held variable

The position currently held refers to whether the respondent was an assistant lecturer up to the Head of department in that institution. Table 4.38 sums up the responses according to the position occupied by the respondents at that time of research.

Table 4.38: Responses by the respondents' position variable

Questions& variables	**Ass lecturer**	**%**	**Lecturer**	**%**	**S/lecturer**	**%**	**HOD**	**%**
Question 1								
Yes	3	37.5	74	67.27	29	80.56	14	93.33
No	5	62.5	36	32.73	7	19.44	1	6.67
Total	**8**	**100**	**110**	**100**	**36**	**100**	**15**	**100**
Question2								
Very necessary	7	87.5	62	56.36	25	69.44	11	64.71
Necessary	1	12.5	42	38.18	11	30.56	6	35.29
No opinion	0	0	5	4.55	0	0	0	0
Unnecessary	0	0	1	0.9	0	0	0	0
Very unnecessary	0	0	0	0	0	0	0	0
Total	**8**	**100**	**110**	**100**	**36**	**100**	**17**	**100**
Question 3								

Strongly Agree	5	62.5	56	50.45	24	72.73	10	58.82
Agree	3	37.5	52	46.85	8	24.24	7	41.18
Disagree	0	0	3	27.03	0	0	0	0
Strongly disagree	0	0	0	0	1	3.03	0	0
Total	**8**	**100**	**111**		**33**	**100**	**17**	**100**
Question 5								
Greater extent	2	28.57	30	27.78	12	33.33	5	31.25
Lesser extent	3	42.86	30	27.78	12	33.33	7	43.75
Not sure	0	0	6	5.56	2	5.56	2	12.5
Not often	1	14.29	21	19.44	7	19.44	2	12.5
Rarely	1	14.29	21	19.44	3	8.33	0	0
Total	7	100	108	100	36	100	16	100
Question 6								
Always	1	14.29	13	11.93	5	14.71	3	20.00
Very often	2	28.57	22	20.18	9	26.47	5	33.33
Not sure	0	0	6	5.50	0	0	0	0
Sometimes	2	28.57	49	26.61	17	50.00	7	46.67
Seldom	2	28.57	19	17.43	3	8.82	0	0
Total	**7**	**100**	**109**	**100**	**34**	**100**	**15**	**100**
Question 7								
Every lecture	2	28.57	14	14.74	4	11.76	3	20,00
Once/twice a week	1	14.29	13	13.68	5	14.71	2	13.33
When appropriate	3	42.86	56	58.95	21	61.76	7	46.67
Once/twice a fortnight	0	0	2	2.11	1	2.94	2	13.33
Once/twice a month	1	14.29	10	10.53	3	8.82	1	6.67

Total	**7**	**100**	**95**	**100**	**34**	**100**	**15**	**100**
Question 9								
Strongly agree	5	62.5	34	31.19	18	51.43	8	47.06
Agree	3	37.5	61	55.96	16	45.71	8	47.06
Not sure	0	0	10	9.17	0	0	1	5.88
Disagree	0	0	2	1.83	1	2.86	0	0
Strongly disagree	0	0	2	1.83	0	0	0	0
Total	**8**	**100**	**109**	**100**	**35**	**100**	**17**	**100**
Question 10								
There is a difference	8	100	88	80.73	29	80.56	14	82.35
No opinion	0	0	13	11.93	6	16.67	2	11.76
There is no difference	0	0	8	7.34	1	2.78	1	5.88
Total	**8**	**100**	**109**	**100**	**36**	**100**	**17**	**100**
Question 11								
Instructional media students perform better academically	8	100	71	66.98	27	79.41	10	62.5
Traditional instruction students perform better academically	0	0	4	3.77	0	0	1	6.25
No comment	0	0	19	17.92	7	20.59	3	18.75
They perform the same academically	0	0	12	11.32	0	0	2	12.5

Total	**8**	**100**	**106**	**100**	**34**	**100**	**16**	
Question 12								
50% more or better	4	50.00	68	67.33	20	62.5	7	50.00
30%-49% better	3	37.5	15	14.85	9	28.13	4	28.57
10% -29% better	1	12.5	14	13.86	1	3.13	1	7.14
1% -9% better	0	0	4	3.96	2	6.25	2	14.29
Total	**8**	**100**	**101**	**100**	**32**	**100**	**14**	**100**
Question 14								
Yes	4	50.00	64	59.81	23	67.64	5	31.25
Somehow yes	4	50.00	26	24.30	4	11.76	9	56.25
I do not know	0	0	11	10.28	6	17.64	1	6.25
Somehow No	0	0	1	0.93	0	0	1	6.25
No	0	0	5	4.67	1	2.94	0	0
Total	**8**	**100**	**107**	**100**	**34**	**100**	**16**	**100**
Question 15								
Positive	3	42.86	59	56.73	21	63.63	9	56.25
Somehow positive	4	57.14	26	25.00	6	18.18	5	31.25
Not sure	0	0	14	13.46	5	15.15	2	12.5
Somehow negative	0	0	4	3.85	1	3.03	0	0
Negative	0	0	1	0.96	0	0	0	0
Total	**7**	**100**	**104**	**100**	**33**	**100**	**16**	**100**
Question 16								
Very strong	2	25.00	16	15.69	11	33.33	7	43.75
Strong	5	62.5	63	61.76	15	45.45	7	43.75
No opinion	1	12.5	16	15.69	6	18.18	1	6.25
Weak	0	0	4	3.92	1	3.03	1	6.25

Very weak	0	0	3	2.94	0	0	0	0
Total	**8**	**100**	**102**	**100**	**33**	**100**	**16**	**100**
Question 18								
Less than P200 000	3	50.00	49	75.38	12	63.16	11	78.57
P200 000-P400 0000	3	50.00	9	13.85	6	31.58	3	21.43
P4000 000-P600 00000	0	0	3	4.62	0	0	0	0
P600 0000-P800 000	0	0	1	1.54	0	0	0	0
P800000-P1000000	0	0	3	4.62	1	5.26	0	0
Total	**6**	**100**	**65**	**100**	**19**	**100**	**14**	**100**
Question 19								
Put to very good use	0	0	16	21.92	6	25.00	3	23.08
Put to good use	2	33.33	26	35.62	8	33.33	8	61.54
I do not know	2	33.33	21	28.77	7	29.17	1	7.69
Put not to good use	2	33.33	9	12.33	1	4.17	1	7.69
Put not to very good use	0	0	1	1.37	2	8.34	0	0
Total	**6**	**100**	**73**	**100**	**24**	**100**	**13**	**100**
Question 20								
Computers &accessories	0	0	37	37.00	18	56.25	9	56.25
Models	0	0	10	10.00	2	6.25	2	12.5
Charts& other illustrations	3	50.00	21	21.00	7	21.88	0	0

Combinations of the above	3	50.00	32	32.00	5	15.63	5	31.25
Total	**6**	**100**	**100**	**100**	**32**	**100**	**16**	**100**
Question 21								
Very cheap	1	16.67	5	5.62	2	7.41	0	0
Easy to use	0	0	35	39.33	11	40.74	5	35.71
Just available	3	50.00	31	34.83	7	25.93	7	50.00
Organizational culture	2	33.33	15	16.85	4	14.81	2	14.29
No reason	0	0	3	3.37	3	11.11	0	0
Total	**6**	**100**	**89**	**100**	**27**	**100**	**14**	**100**

The position which the respondents held in the institution was included in this study. It was assumed that position which the respondents held might have an effect on the overall results and findings of this study. The four positions were; assistant lecturer, lecturer, Senior lecturer, heads/chairs of departments. The results form table 4.38 show that positions of the respondents which they held at the time of research had no influence on the view of the respondents, for example in questions 15 and 16 below the results from table 4.38 are as follows: Question 15 required the respondents to describe the relationship between instructional media and tertiary students' conceptualization of intended learning outcomes. These are the results form table 4.38; 100 % of assistant lecturers describe the relationship as somehow positive to positive, 81.73 % of lecturers saw the relationship as somehow positive to positive, 81.81% of Senior lecturers described the relationship as somehow positive to positive. The Heads/chairs of departments had 87.5 % of the HODs reporting somehow positive to positive relationship. All the four positions projected the same views about the relationship between instructional media and tertiary students' conceptualization of intended learning outcomes. In question 16 required the respondents to show the strength of the relationship between instructional media and tertiary students' conceptualization of intended learning outcomes as identified by the respondents in question 15. Table 4.38 shows the following results; 87.5 % of the assistant lecturer viewed the relationship

between instructional media and tertiary students' conceptualization of intended learning outcomes as strong to very strong relationship. 77.72 % of lecturers reported the relationship as strong to very strong. 78.78 % of Senior lecturers indicated strong to very strong relationship. 87.55 % of Heads/chairs of departments showed strong to very strong relationship between instructional media and tertiary students' conceptualization of intended learning outcomes. The responses from the four positions held by respondents during research for this study from the seventeen questions reveal that positions held by the respondents had insignificant impact on the overall results and findings of this study.

4.12.5.1 Conclusion to the position currently held variable

. The analysis of this variable revealed that positions of respondents had no influence on their choices of responses for this study. It was concluded that positions respondents held at tertiary education did not influence the results; therefore, the results and findings of this study are considered reliable and are consistent with respondents' perceptions about instructional media in tertiary students' conceptualization of intended learning outcomes in Botswana.

4.13 Conclusion on consistence and reliability of results and findings

This study used the following five demographic variables; gender (sex), age, highest qualification, years of teaching experience and position currently held by the respondents. Only valid percentages were used in this simple reliability test exercise. This was done to assist the researcher to verify consistence and reliability of this study results and findings before making conclusions. The purpose was to check the final results of this study against the five demographic variables which might have an influence over the overall results, thus elimination of bias. All the five demographic variables mentioned above, showed insignificant influence on the final result and findings of this study *(see section 4.10: reliability and consistency of empirical results findings).* Therefore the final results of this study are consistent with the views of the respondents as indicated by the results each individual variable analyzed above. It is therefore considered that the results and findings of this study are reliable, and can be

taken to be true representative of the perceptions of tertiary educators in Botswana *(see objective one of this study - section 1.6).*

CHAPTER FIVE

5.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

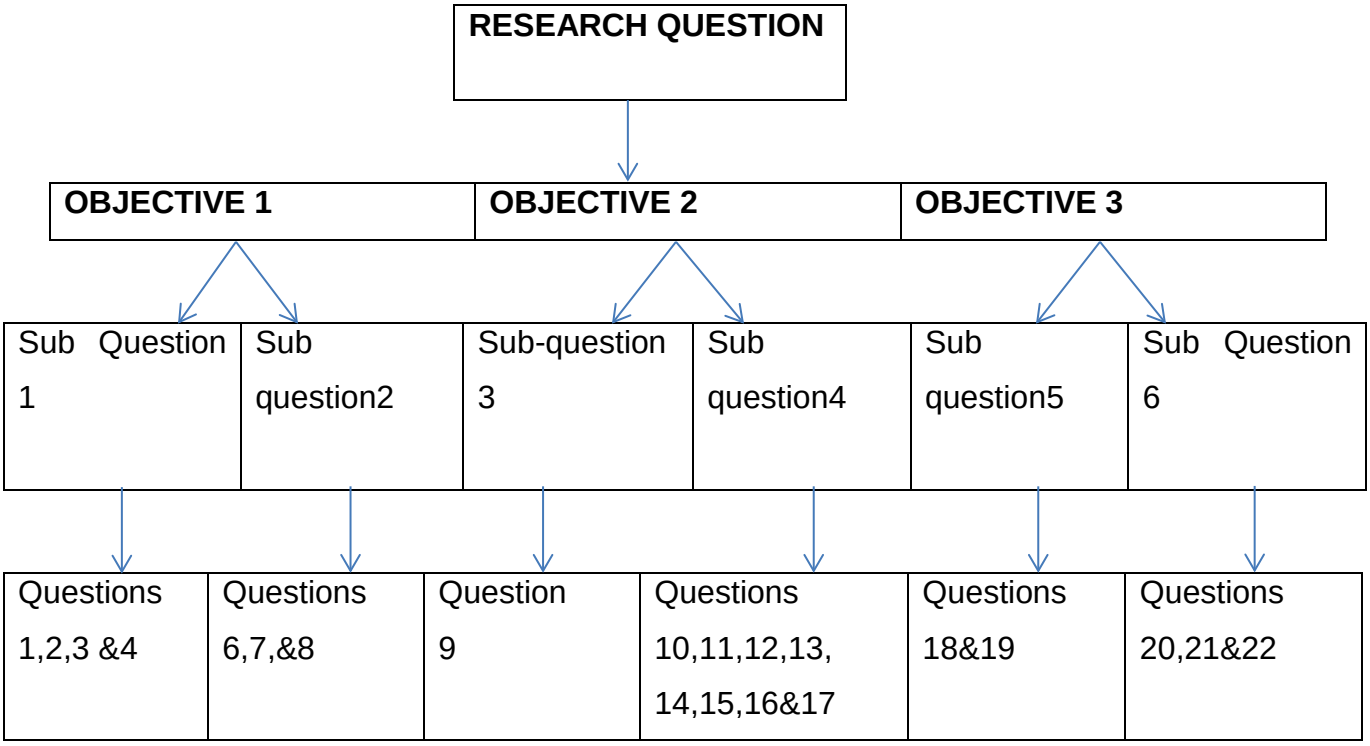
5.1 Introduction

This chapter presents the theoretical and empirical summary findings, conclusions and recommendations of this study. This study surveyed the role of instructional media in tertiary students' conceptualization of intended learning outcomes in Botswana. The information is presented here in the following order: brief background to research, discussion of research problem, key findings, conclusions, implications for existing theory, recommendations for implementation or suggestion for application.

The final analysis of the results for reliability and consistence, the summary and conclusions were based solely on the valid percentage as indicated before. The following model - the "Lampshade model", figure 5.1 below was used to develop this study from research question to objectives, to sub questions and finally the research instrument-the questionnaire which was used in this survey. The analysis of results of this study used the "Funnel model", as the opposite of the lamp shade model by simply turning the Lampshade model to become the Funnel model , figure 5.2 below, was used to analyse the questions , then the sub questions followed by the objectives and finally the objectives culminating to the research question in that order. Furthermore , for authenticity of the results, a simple reliability test was used which involved the analysis of respondents' demographic variables in order to check if the variables influenced the final outcomes of this study, which could affect the validity and reliability of the final result if for example; any of the following demographic variables such as a certain qualification or sex or age group. Or any number of years of experience or a position held by the respondents in the institution having a greater impact than the other variables, would then influence the final results and findings of this study. From the analyses of the variables in chapter four of this study, the conclusions that are presented in this chapter five of this study are from the results that are considered

consistent with the perceptions and views of the tertiary educators in Botswana and the results are also considered reliable and valid.

Figure 5.1: Lampshade Model



This Lampshade model, figure 5.1 above simply shows the summary of how the research was developed from research question. The research question was divided in to three objectives; each objective had two sub questions. Each sub question had a number of questions in order to fully answer it with the exception of sub question 3, which had a single question.

Now to analyse the results so as to come up with conclusions of the study, the Lampshade model, figure 5.1, was turned upside down to Funnel model, as shown by figure 5.2 below, thus providing an answer to the research question; what is the role of

instructional media in tertiary students' conceptualization of intended learning outcomes in Botswana?

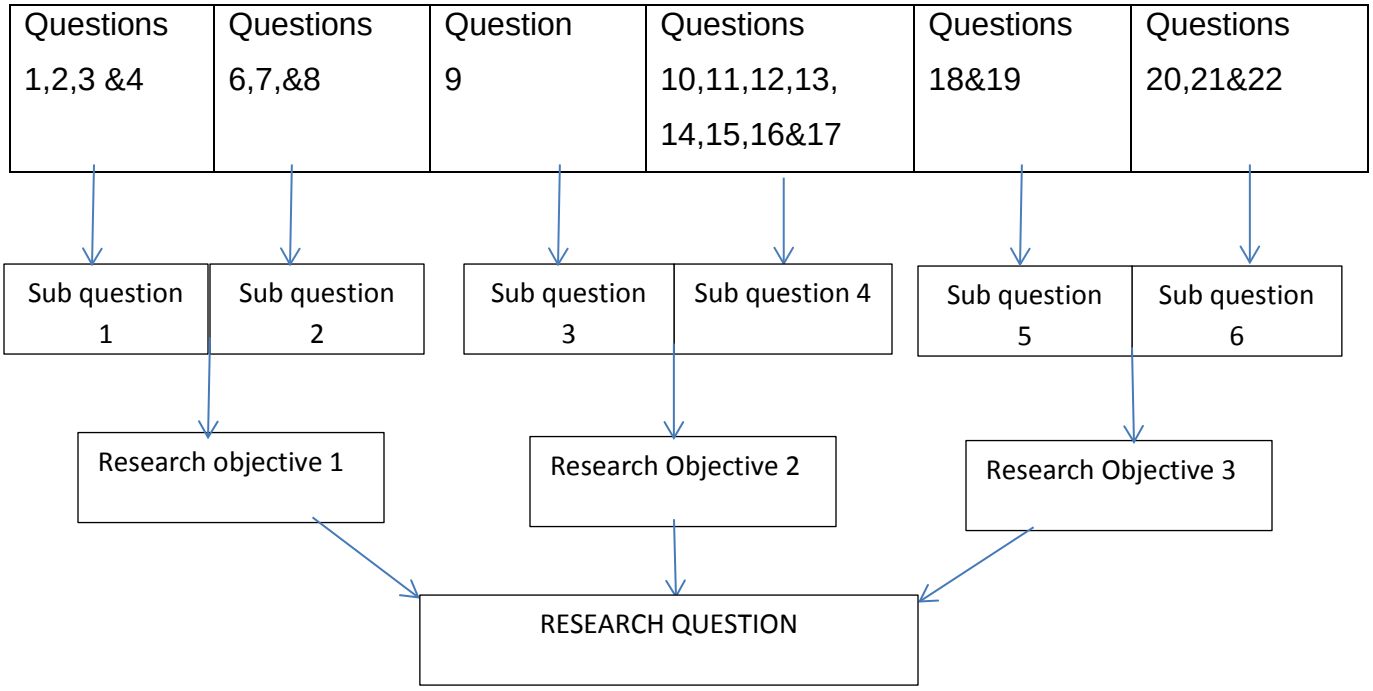


Figure 5.2: Funnel Model

5.2 Brief background to research

The effectiveness of instructional media has been debated and researched from time of Clark /Kozma debate on the effectiveness of instructional media in the teaching and learning process (Marx 2006).The current research have not come to a conclusive agreement about the effectiveness of instructional media. The debate still goes on, between the strong media effect and the weak media effect schools of thought. In this study, the research question was: "**What is the role of instructional media in tertiary students 'conceptualization of intended learning outcomes at tertiary level of education in Botswana?"** The current study investigated educators' perceptions about instructional media.

5.3 Objectives of the study

This study had three objectives, which informed the formulation of the research sub questions (*See section 1.6 for detailed explanation of objectives).*

5.4 Sub questions

The purpose of the sub questions was to break the research question in to manageable units for data collection, in order to answer the research question, and for this study, the following were the sub questions that informed the construction of the questionnaire *(See section 1.4 for detail on sub questions*).

5.5 Research design and methodology

This study used the quantitative research design and the qualitative design to a lesser extent and focused on the survey method.

5.6 Research instruments

This study used a structured questionnaire. The questionnaire for this study had 22 items, of which, seventeen items were closed ended and five open ended questions *(see appendix 2 for research instrument*).

5.7 Population

The population comprised of all tertiary institutions in Botswana registered and accredited by either by Botswana Qualification authority (BQA) and Human Resources Development Council (HRDC). The population frame was composed of 284 BOTA registered and accredited institutions and 36 TEC registered and accredited institutions.

5.8 Sampling procedures

This study used mainly probability sampling procedures, and this was done to increase the degree of representativeness and heterogeneity in the sample for generalization purposes. This study then followed a probability sampling technique; which the researcher called systematic stratified random sampling technique, which combined the systematic and stratified techniques. To a lesser extend this study used the non-probability sampling technique-purposive.

5.9 Units of analysis

The units of analysis for this study were the responses indicated on the questionnaires by the respondents about "the role of instructional media in tertiary students' conceptualization of intended learning outcomes in Botswana."

5.10 Summary of findings

Objective one (1)

The first objective of this study was, "**To examine and describe the effectiveness of instructional media in the conceptualization of intended learning outcomes at tertiary level of education."** This objective had two sub questions *(See section 1.6.1).*

Sub question one (1)

73.6 % of respondents used instructional media, against 26.4 % of the respondents who did not.

97.3 % of respondents in Botswana reported that instructional media were necessary in the tertiary students' conceptualization of intended learning outcomes, against 0.5 % of the same respondents who said instructional media were unnecessary.

98.9 % of respondents in Botswana said that instructional media were relevant in the teaching and learning at tertiary level of education, against 1.1 % of the respondents who disagreed.

92.4 % of respondents reported that instructional media were necessary and relevant in the teaching and learning at tertiary level of education in Botswana. 7.4% of respondents reported that instructional media were not necessary and relevant.

Sub question two (2)

61% of respondents in Botswana used instructional media during teaching and learning process from **lesser extent** to **greater extent** against 32.7% of respondents who **rarely** to **not often** used instructional media.

81.7 % of respondents used instructional media during the **actual** teaching and learning process against 13.8% of tertiary educators who **seldom** used instructional media.

43.7 % of the respondents used instructional media every lecture to once/twice a month, and 56.4 % of respondents used instructional media when appropriate, during teaching and learning process.

The extent and frequency of using instructional media were influenced by the following factors: lack of resources (49.6%), effective teaching and making concepts understood better (29.3%) and those tertiary students do not require instructional media (6.5%).

Objective two (2)

The purpose of the second objective was, "**To justify and verify, if there is a correlation between instructional media and students' academic achievement, at tertiary level of education.** This objective had two sub questions *(See section 1.4 for details on explanation on sub questions).*

Sub question three (3)

88.7 % of respondents **agreed** to **strongly agreed** that there were some other benefits of using instructional media in the teaching and learning process compared to 4.4 % of the tertiary educators who **disagreed** to **strongly disagreed.**

Sub question four (4)

(81%) of respondents in Botswana indicated that there were some differences in conceptualization of intended learning outcomes among students taught using instructional media from those taught using the traditional ways, against 6.1% of the respondents that there were no differences in academic performance. 70.7 % of the respondents said that "Students who are taught using instructional media perform better." 18.4 % of respondents had "no comment." 7.5 % of the respondents commented, "The students generally perform the same academically**."** 3.4 % of the respondents reported that **"**Students who are taught using traditional ways perform better**."**

100 % of the respondents agreed instructional media enhanced tertiary students' conceptualization of intended learning outcomes, although at different percentile gain**.**
83.6 % of respondents reported that that instructional media provided "Motivation, attentiveness, and widened the tertiary students' scope of knowledge." 13.4 % of respondents stated, "Both instructional media and traditional media complemented each other." 3 % of respondents commented, "Traditional ways of teaching were better".

Objective three (3)

The purpose of the third objective was, "**To establish the status of instructional media usage, in the tertiary sector of education**." This objective had two sub questions *(See section 1.4 for explanation of sub questions).*

Sub question five (5)

81.1 % of the respondents said they spent less than P200 000annually on purchasing and maintenance of instructional media as an institution. 13.5 % of the respondents spent above P200 000-P400 000 annually. 5.5 % of the respondents spent above P800 000 annually on purchasing and maintenance of instructional media as an institution.
59.3 % of the respondents in Botswana evaluated the usage of money in buying and maintaining of instructional media was put to **Good and Very good use**, against 12.2 % of the respondents who evaluated the usage of money as being **not put to good** use and **not put to very good use**. 28.5 % of the respondents in Botswana did not know whether the usage of the money was put to good use or not.

Sub question six (6)

38.6 %, of respondents used **Computers and accessories.**32.9 % of respondents used **Combination of instructional media.**19.6 % of respondents Charts **and other illustrations.** The reasons why respondents frequently used "that instructional media" Were: 40% of respondents said they were **easy to use.**33.3 % of respondents reported that they **were just available** and 16.3 % indicated that it was **organizational culture.**

5.11 Key findings

Sub question one (1)

73.6 % of respondents used instructional media. 97.3 % of respondents reported instructional media were necessary in the tertiary students' conceptualization of intended learning outcomes. 98.9 % of respondents in Botswana agreed that instructional media were relevant at tertiary level of education. 92.4 % of respondents said that instructional media were necessary and relevant in the teaching and learning.

Sub question two (2)

61 % of respondents used instructional media during teaching and learning process. 81.7 % of respondents used instructional media during the **actual** teaching and learning process.43.7 % of the respondents used instructional media every lecture to once/twice a month. 56.4 % of respondents used instructional media when appropriate.

The extent and frequency were influenced by the following factors: lack of resources (49.6 % of respondents), effective teaching and making concepts understood better (29.3 % of respondents).

Sub question three (3)

88.7% of respondents reported they were other benefits of using instructional media in tertiary education.

Sub question four (4)

81% of respondents' perception was that there were some differences in conceptualization among students taught using instructional media from those taught using the traditional ways. 70.7 % of the respondents agreed "Students who are taught using instructional media perform better than those students taught using traditional ways."100% of the respondents agreed instructional media enhanced tertiary students' conceptualization of intended learning outcomes. 83.6% of respondents' viewed instructional media as providing "motivation, attentiveness, and widening the tertiary students' scope of knowledge."

Sub question five (5)

81.1% of the respondents spent less than P200 000 annually on purchasing and maintenance of instructional media as an institution.59.3 % of the respondents evaluated the usage of money in buying and maintaining of instructional media as was put to **Good and Very good use.**

Sub question six (6)

38.6%, of respondents used **Computers and accessories.** 32.9 % of respondents used **Combination of instructional media.** 19.6 % of respondents Charts **and other illustrations.** The reasons why respondents frequently used "that instructional media" Were: 40 % of respondents said they were **easy to use.**33.3 % of respondents reported that they **were just available** .16.3 % indicated that it was **organizational culture.**

5.12 Conclusions

This research study had three objectives that were formulated in order to answer the research question; what is the role of instructional media in tertiary students' conceptualization of intended learning outcomes in Botswana? Having tested the reliability of the results of this study, conclusions are drawn from empirical findings as well as from theoretical findings .The following are the conclusions form empirical findings of this study.

5.12.1 Conclusions from empirical findings

Following were the conclusions drawn from the empirical findings of this study from the three objectives *(See section 1.6 for details on objectives)* and finally the overall summed conclusion to the research question as follows:

1. Tertiary education respondents in Botswana used instructional media during teaching and learning process. Their perception was instructional media was necessary and relevant in tertiary students' conceptualization of intended learning outcomes. Further, tertiary educators in Botswana agreed to the fact that instructional media were relevant in the teaching and learning at tertiary level of education in Botswana. Respondents

reported that instructional media were necessary. The conclusion for research objective **(1)** (*see section 1.6 on objectives of this study)* was instructional media were being used in the teaching and learning process at tertiary level of education; it is viewed as relevant, necessary and enhances tertiary students' conceptualization of intended learning outcomes in Botswana.

2. It was therefore concluded for research objective **(2)** that, there was a strong, positive correlation between instructional media and tertiary students' conceptualization of intended learning outcomes in Botswana. This strong and positive correlation is because instructional media have other benefits to tertiary students such as; personal researches, effective teaching and learning, illustrations etc. which assisted tertiary students' conceptualization of intended learning outcomes. Moreover, there were some differences up to 50 % more or better in tertiary students' conceptualization of intended learning outcomes when comparing students taught using instructional media, against students taught using the traditional ways of instruction.

The above evidence further supported and reinforced the strong media effect school of thought. The conclusion above is therefore, in line with the findings of Rutz, Eckart, Wade, Maltibie, Rafter and Elkins (2003), found out that instructional media influence academic achievement of students. Similar to this conclusion of this study are the findings of Peake et al (2005), who also concluded that there is a positive relationship between instructional media integration and students' academic achievement.

3. When coming to cost of instructional media, that was the money they used to purchase and maintain instructional media, as departments, faculties and/ or institutions. It was concluded for objective (**3)** that departments spent between less than P 200 000 to a maximum of P800 000 per annum, with the exception of the faculties up to P400 000 per annum. Furthermore, it was concluded that respondents during teaching in their institutions mostly used Commuters and accessories, followed by a combination of instructional media, finally charts and other illustrations in tertiary students' conceptualization of intended learning outcomes in Botswana. The study further concluded that, the amount used to purchase and maintain instructional media at departmental, faculty and or institutional level was seen to be put to good and very

good use. It was also concluded that the three main reasons why respondents frequently used “that instructional media” only were that; they were **easy to use,** they **were just availabl**e and it was their **organizational culture.** This use of the same instructional media was a result of **lack of resources,** the need to **improve learning** and that they were the only **instructional media available** in their institutions.

The research question for this study was: **“What is the role of instructional media in tertiary students’ conceptualization of intended learning outcomes at tertiary level of education in Botswana?”** This research question was answered from the conclusions of the three research objectives above *(see figure 5.2 for illustration above)*, and therefore, the researcher’s overall conclusion to the question above is : It was concluded that the role of instructional media in tertiary students’ conceptualization of intended learning outcomes at tertiary level of education in Botswana was that; instructional media enhanced conceptualization of intended learning outcomes, instructional media improved academic performance or academic achievement of tertiary students who were taught using instructional media as opposed to traditional instruction in Botswana. Furthermore, its role also included improving academic achievement of the learners, up to estimated 50% more or better than students who were taught using the traditional ways. In connection to the above, its role included enhancing effective teaching and effective learning during the process of teaching and learning, culminating to tertiary students’ conceptualization of intended learning outcomes; again instructional media was to arouse interest in the tertiary students, increasing motivation, attentiveness, during conceptualization of intended learning outcomes .Instructional media’s role also involved widening the tertiary students’ scope of knowledge. Furthermore, the role of instructional media was that it made teaching easier for tertiary education lecturers and communication with students was made easier during instruction at tertiary level of education in Botswana. Finally, the role of instructional media in the tertiary students’ conceptualization of intended learning outcomes was assisting special needs students in education with different educational disabilities to cope with learning environment at tertiary level of education. This conclusion is consistent with the strong media school of thought in the Clark/Kozma

debate of 1994 on the effectiveness of instructional media (Marx 2006). The conclusion above is in line with the findings of other scholars in the strong media effect paradigm of instructional media. The scholars such as; Isiaka (2007), Bada (2011), Gulek and Demirtas (2005), that support this school of thought. Rutz, Eckart, Wade, Maltibie, Rafter and Elkins (2003), who found that instructional media influence academic achievement of students, these findings, are in agreement with the results of Peake, Briers and Murphy (2005), whose findings also support that a positive relationship exists between technology integration and students achievement in basic academic subjects(2005:29).

5.12.2 Conclusions from theoretical findings

Literature reviewed for this study has the following findings about the ongoing debate on the effectiveness of instructional media in the conceptualization of intended learning outcomes as observed by Clark (2001). The following conclusions have been drawn from theoretical findings as follows: (a) currently there is no conclusive evidence agreed upon on the effectiveness of instructional media in the teaching and learning process. Each school of thought continues to carry out studies which support its own views about instructional media and conceptualization of intended learning outcomes (b) No sooner end to the debate- the debate is still going on about the role of instructional media and the effects on conceptualization of intended learning outcomes without proponents from both sides agreeing on the position about the effects of instructional media in teaching and learning process, specifically in the conceptualization of intended learning outcomes, and up to date there is very little evidence to suggest that the debate will end soon. This is the observation by Materi (2000:3), who argues that, “The media and learning debate will likely carry on; whatever the study, proponents in either camp will likely find fault with it.” This statement affirms the conclusion by the researcher of this study that the debate still goes on. Hastings and Tracey (2005:28), have a similar conclusion about the debate on the effectiveness of instructional media as they claim that, “Whether or not the media of 1983 could, would, or should affect learning has never been resolved and likely never will be.” Finally (c) The current debate on the

effectiveness of instructional media and the conceptualization of intended learning outcomes produced a third view or mixed effect school of thought; that either supports or negates both schools of thought, this has further complicated the debate as this third view about the effectiveness of instructional media seems to nullify the current argument between strong media effect and weak media effect. The findings of the emerging third view seem to say there “is nothing to argue about”, since the results neither confirms nor negates either of the two schools of thought.

5.13 Implications for existing theory

The findings and conclusions from this study support the strong media effect school of thought, and negate the weak media effect school of thought, that is instructional media has a positive impact on tertiary students ‘conceptualization of intended learning outcomes. Furthermore, instructional media is necessary and relevant to tertiary students’ conceptualization of intended learning outcomes. Besides aiding conceptualization of intended learning outcomes, instructional media makes teaching become easier, motivates the learners, has a bearing on students’ attentiveness during teaching and learning, and makes communication with the students easier. All these aspects from the findings mentioned above strengthen the strong media effect school of thought. Therefore, overall instructional media is necessary and relevant and needed in tertiary education because of the reason that there is a correlation between instructional media and students’ conceptualization of intended learning outcomes at tertiary level of education in Botswana. It is estimated to increase the “learning” up to 50% more or better in comparison to traditional ways of instruction.

The other implication to the existing strong media effect theory is that instructional media should be used in teaching and learning process at tertiary level of education. This is supported by scholars who claim that about 70 % of tertiary students do not reach and operate at formal operational stage of cognitive development (Piaget) or Symbolic stage (Bruner), but operate at concrete (Piaget) or iconic (Bruner) stages of cognitive development (Huitt and Hummel (2003:3), and therefore they need instructional media for conceptualization of intended learning outcomes to take place.

Furthermore, the findings of this study imply that; to the existing theory, there is still need to investigate the role of instructional media in tertiary students' conceptualization of intended learning outcomes, paying special attention to specific subject areas of study and specific types of instructional media that are to be used in that particular subject areas. It seems from this study, subject specializations in institutions had an influence or are inclined to be taught with certain instructional media and other materials hence may be biased to instructional media. Furthermore, these findings to the existing theory also imply that instructional media should not be viewed from conceptualization effect on intended learning outcomes, but should be holistically viewed because instructional media is seen to have other benefits such as; attentiveness, motivation easier teaching and learning, easier communication, which have been associated with tertiary students' conceptualization of intended learning outcomes in Botswana.

5.14 Recommendations for implementation or Suggestions for application of research

The findings indicated that instructional media enhanced conceptualization of intended learning outcomes. Students who were taught using instructional media performed better than students who were taught in the traditional ways. Therefore, a policy formulation is needed on instructional media and teaching /learning process- since it seems there is no clear policy on the financing, procurement, and use of instructional media at tertiary level of education*(see key findings for sub questions five and six),* as reasons for this suggestion or recommendation. The policy formulation is needed to cater for financing, procurement and use of instructional media in tertiary institutions.

There are shortages of teaching resources (instructional media) in tertiary institutions of Botswana as indicated by 44.9 % of respondents. This can be addressed by policy formulation as indicated above if nothing is in existence concerning instructional media in certain institutions currently, procurement of a variety of instructional media for organizations that do have an organizational culture to use instructional media during teaching and learning. Management of institutions should take a lead to make instructional media a priority and key component of effective teaching and learning

process at tertiary level of education in Botswana. This would enhance conceptualization of intended learning outcomes, making teaching and learning to be interesting to tertiary students in Botswana.

It is further recommended that for implementation of instructional media policy in tertiary institutions, training of teaching staff is a priority on the importance and use of instructional media during teaching and learning process, this avoids the instructional media to become a white elephant. Training allows the teaching staff to be effective when preparing teaching materials and using instructional media during lesson delivery. This would enhance tertiary students' conceptualization of intended learning outcomes, since most of the tertiary educators lacked pedagogical skills.

Finally to apply the research findings of this study fully, the following suggestion is recommended that tertiary education teaching staff to be equipped with knowledge about research, for example Action research for them to discover the appropriate types of media suitable for their students' cognitive development levels and their effects on students' conceptualization of intended learning outcomes, rather than the teaching staff wholesomely taking the findings without their own situation specific inputs.

5.15 Summary contribution

The research findings contribute to the body of knowledge in the following aspects; firstly, research findings indicate that tertiary education students need instructional media to conceptualize the intended learning outcomes, contrary to the general feeling that tertiary students can learn abstractly. This is supported by the argument presented by Huitt and Hummel (2003:3) that, cross-sectional studies of adolescents do not support the assertion that all individuals will automatically move to the next cognitive stage as they biologically mature. Data, from adolescent population indicates 30 % to 35 % of high school seniors attain the cognitive development stage of formal operational stage. The formal operational stage assumes that the leaner is capable of learning abstract concept without necessarily using instructional media to aid conceptualization of intended learning outcomes. This means that the majority of high school learners who constitute between 65 % to 70 % may never get to formal operational stage, implying

that conceptualization of intended learning outcomes may need instructional media since they will be operating at concrete stage of cognitive development. Secondly, the findings of this study show that there are other benefits to tertiary students and lecturers when instructional media is used during teaching and learning process other than the 'conceptualization effects' that has taken center stage in the instructional media effect debate. These other important benefits of using instructional media at tertiary level of education include among others; motivation of the learners, gaining attentiveness, assist in individual research, and assist students with special needs to grasp the concepts easily and on the side of the lecturers makes teaching exciting and lesson delivery easier. Thus, basically supporting the strong media effect school of thought. Zahra (2016:8), on the issue of other benefits got when using instructional media in teaching and learning process further confirms the findings of this study by saying that "… they capture images in their minds and as a result it is much easier for them to recall these images rather than plain text from a book…" This simply means instructional media aids long term memory, which is a benefit to the learners in that they can remember what has been taught and learnt. Thirdly, at tertiary level of education, instructional media is very necessary, relevant and useful in teaching and learning process in that; it aids conceptualization of intended learning outcomes, students gaining academically although at various percentages gain up to estimated 50% more or better than those students who are taught using the traditional ways of instruction. Furthermore, instructional media helps in making communicating the ideas or concepts to students easier during teaching and learning process. The majority of tertiary institutions' respondents in Botswana continue to use instructional media during teaching and learning process. This continued use of instructional media in tertiary institutions by respondents is an indication that instructional media is playing an important role in their teaching and learning process. It is this role of enhancing conceptualization of intended learning outcomes and the improvement of the conduciveness of the teaching and learning environments in tertiary institutions, the cornerstone of teaching and learning. Finally demographic factors such as; gender, qualifications, number of years of teaching experience, ages and positions held by the respondents do not influence the general perceptions of respondents with regards to

instructional media's role in tertiary institutions and the conceptualization of intended learning outcomes.

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INFORMED CONSENT

Dear respondent(s)/participant(s)

My name is Gweshe M A student number 34956018 studying for a Doctor of education (DEd) degree with University of South Africa, UNISA, carrying a descriptive survey of the opinions or attitudes of educators on "The role of instructional media in tertiary students' conceptualization of intended learning outcomes in Botswana." The results of this survey are for academic purposes only. I promise that all ethical considerations of confidentiality, anonymity and privacy are strictly taken in to consideration. This is voluntary participation and within any given time you can opt to leave this research, without penalty and prejudice. You are also informed that you may not answer any question or part of the question in this study that you are not comfortable with.

The purpose of this study is to find out, justify and verify the relevance, usage and impact of instructional media on tertiary students' conceptualization of intended learning outcomes, and to clear any misconceptions, locally, nationally and globally about the relationship between instructional media and tertiary students' academic achievement as observed and asserted by Tuckman (1972:295), "There is also a need in education for the establishment and verification of theories or models."

The selection of the sample of participating institutions is purely by stratified random sampling procedure/technique, a minimum of five respondents per institution. **Participants are informed that they have a right to refuse to participate, and withdraw from this study at any given point in time without penalty and prejudice. Your participation in this study is voluntary, and participants are requested to read and sign informed consent, which you can terminate at any time if you wish so. The researcher promises that anonymity, confidentiality and privacy of participants and information is safeguarded by a provision not to identify themselves the participants as indicated on the questionnaire (demographic information of participants)**

The questionnaire has 22 questions, of which 17 questions out of 22, each has between two to five responses from where you select one response and tick. The other remaining 5 questions are free response, to give the participant(s) a chance to express their observations, reasons or justification of their selected responses. It also gives you the participant the opportunity to share your personal views and or experiences with the researcher, which would not have been captured by the researcher's pre coded responses.

The results of this study shall be disseminated to each sampled institution, a hard copy and a soft copy. Apart from this, the other means of dissemination of the research results shall be in accordance to the, "Guidelines for Research, (2007, section 4.6)" of the Ministry of Education and Skills Development, Botswana.

Please note that this research has been issued with a research permit by the Ministry of Education And Skills Development, Botswana as an approval to conduct the study. As part of research ethics on informed consent, please acknowledge that you are voluntarily participating in this research survey without any, or whatsoever form of being forced to, by signing and date the below statement.

I voluntarily participate in this survey on mine own personal volition, for academic purposes only.

Signature.....**Date**.....

Please find attached copies of (a) research permit (b) approval of topic (c) ethical clearance certificate, for your perusal.

You may contact me on; my mobile 71788050/72423365 or my e-mail [redacted] or34956018@my.life.unisa.ac.za

You may contact my supervisor, Dr PJ Heeralal, Tel (+27) 012 429 2318, email [redacted]

Thank you

2

THE QUESTIONNAIRE

Introduction

This questionnaire is for a survey aimed at seeking your opinions or attitudes towards the role of instructional media in the teaching and learning process at tertiary level of education, particularly the role of *instructional media in tertiary students' conceptualization of intended learning outcomes in Botswana.*

Completion of the Questionnaire

1. The first part **(A)** is demographics, which is your personal information. **Please note that your name is optional. You can complete this questionnaire without necessarily having written your name and you are informed that you may not answer any question or part of a question in this study that you are not comfortable with.** The second part **(B)** is institutional information.
2. The Third part**(C)** is the actual survey where you tick (√) the pre coded response of your choice. After every two or three questions, there is an open ended question that requires you to make a comment, observation or point of information, using your own words.
3. **I request that the head of office or nominee, Heads of departments, and any two lecturers to complete this questionnaire. At least a minimum of five respondents per institution will suffice.**

PART A DEMOGRAPHICS

NAME..... (OPTIONAL) SEX M ☐ F ☐

AGE 25 30 ☐ 31 40 ☐ 41 50 ☐ 51 65 ☐

HIGHEST QUALIFICATION:

DIPLOMA ☐ HIGHER/ADVANCED DIPLOMA ☐ BACHELOR'S DEGREE ☐ HOUNORS DEGREE ☐

MASTERS DEGREE ☐ DOCTORAL DEGREE ☐

YEARS OF EXPERIENCE: 1 5 ☐ 6 10 ☐ 11 20 ☐ 21 30 ☐ 31&ABOVE ☐

POSITION CURRENTLY HELD

Vice chancellor ☐ Principal ☐ President ☐ Coordinator ☐

Pro/Vice chancellor ☐ Deputy Principal ☐ Deputy President ☐ Dean ☐

Head/chair of department ☐ Professor ☐ Associate professor ☐ Senior lecturer ☐

Lecturer ☐ Assistant lecturer ☐

PART B INSTITUTIONAL INFORMATION

OWNERSHIP OF INSTITUTION: COMMUNITY ☐ PRIVATE ☐ NGOs ☐ PARASTATAL ☐ PUBLIC ☐

CATEGORY: POLYTECHNIC ☐ BRIGADE ☐ COLLEGE ☐ UNIVERSITY COLLEGE ☐ UNIVERSITY ☐

SPECIALISATION: EDUCATION ☐ HEALTH ☐ ENGINEERING ☐ RELIGIOUS ☐ VOCATIONAL ☐
MIXED ☐ BUSINESS ☐

TYPE OF INSTITUTION: Private ☐ Government ☐ Parastatal ☐

PART C-QUESTIONNAIRE

1. *Do you use instructional media in the teaching and learning process at tertiary level of education?*

   Yes ☐ No ☐

2. What is your opinion about the necessity to use instructional media in tertiary students' conceptualization of intended learning outcomes?

   Very necessary ☐
   Necessary ☐
   No opinion ☐
   Unnecessary ☐
   Very unnecessary ☐

3. Instructional media is relevant in the teaching and learning process at tertiary level of education. Do you agree or disagree?

   Strongly agree ☐
   Agree ☐
   Disagree ☐
   Strongly disagree ☐

4. Give reason(s) for your choice of responses in questions 2&3 above

   .....

   .....

   .....

5. To what extent do you use instructional media during the teaching and learning process, in your institution?

   Greater extent ☐
   Lesser extent ☐
   Not sure ☐
   Not often ☐
   Rarely ☐

6. How often do you use instructional media during the actual teaching and learning process?

   Always ☐
   Very often ☐
   Not sure ☐
   Sometimes ☐
   Seldom ☐

7. From your response in question 6 above, how many times do you actually use instructional media during teaching and learning process?

- Every lecture ☐
- Once/twice a Week ☐
- When appropriate ☐
- Once/twice a fortnight ☐
- Once/ twice a Month ☐

8. Give reason(s) for the responses given in questions 5, 6 & 7

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9. There are some benefits other than academic achievement associated with the use of instructional media in the teaching and learning process. Do you agree or disagree?

- Strongly agree ☐
- Agree ☐
- Not sure ☐
- Disagree ☐
- Strongly disagree ☐

10. In your own opinion, is there any difference(s) in academic performance among students taught using instructional media from those taught using the traditional ways?

- There is a difference ☐
- No opinion ☐
- There is no difference ☐

11 Select a comment for your response in question 10 above

- Students who are taught using instructional media perform better academically ☐
- Students who are taught using traditional ways perform better academically ☐
- No comment on the two systems of teaching above ☐
- The Students generally perform the same academically ☐

12. In your opinion, what would you suggest as the average percentage gain of students taught with instructional media against the students taught using traditional ways in their academic performance?

- They perform 50% or better, more than the counterparts ☐
- They perform 30 -49% more than the counterparts ☐
- They perform *10 29%* more than the counterparts ☐
- They perform *1 9%* more than the counterparts ☐

13. Make a comment about your choice of responses in questions 10, 11 & 12 above.

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14. Is there any relationship between instructional media and tertiary students' conceptualisation of intended learning out comes?

Yes ☐
Somehow yes ☐
I don't know ☐
Somehow no ☐
No ☐

15. How would describe the relationship you have identified in question 14 above in terms of tertiary students' conceptualizations of intended learning outcomes?

Positive ☐
Somehow Positive ☐
Not sure ☐
Somehow Negative ☐
Negative ☐

16. How do you rate your description of the relationship which you identified in question 15 above, in terms of tertiary students' conceptualizations of intended learning outcomes?

Very strong ☐
Strong ☐
No opinion ☐
Weak ☐
Very weak ☐

17. Give reason(s) for your responses in questions 14, 15&16

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18. How much roughly do you spend annually on purchasing and maintenance of instructional media?

As: a department ☐ a faculty ☐ an institution ☐ *(Please tick the appropriate before selecting the estimated amount)*

Less than P200, 000 ☐
AboveP200, 000 to P400, 000 ☐
Above P 400,000 to P600, 000 ☐
AboveP600, 000 to P800, 000 ☐
Above P800, 000 to 1000 000and above ☐

19. In your opinion, evaluate the usage of your chosen amount in question 17. The money is.....

- Put to very good use ☐
- Put to good use ☐
- I don't know ☐
- Put not to good use ☐
- Put not very good use ☐

20. Which instructional media do you frequently use in your institution/ when you teach?

- Computer and accessories ☐
- Models ☐
- Charts & illustrations ☐
- Combinations of any of the above & others ☐

21. Why do you frequently use the instructional media mentioned in question 19 above?

- Very cheap ☐
- Easy to use ☐
- Just available only ☐
- Organisational culture ☐
- No reasons ☐

22. Make a comment about questions 19&20

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.....

Many thanks and stay blessed. Amen.

3

GWESHE M.A.

Box 30534

Francistown

28/04/2013

The Permanent Secretary

Min of Education

Private Bag 005

Gaborone

Dear Sir/Madam

RE: APPLICATION FOR ACADEMIC RESEARCH PERMIT FOR DOCTOR OF EDUCATION (DEd) DEGREE.

The above subject refers. I am a Zimbabwean resident in Botswana as a lecturer currently at BA ISAGO University College, wishing to apply for research permit for academic purposes towards a doctorate in education.

I have been working in Botswana for the past fourteen years as an educationist in secondary schools and tertiary institutions, holding positions of responsibility.

My approved topic by UNISA, is **"The role of instructional media in tertiary students' conceptualisation of intended learning outcomes in Botswana"**

Basically, the main idea is to find out the impact of instructional media at tertiary level of education, when it comes to conceptualisation of intended learning outcomes.

Could you please facilitate the process of research permit, simply the reason being that, I need to submit my intention for the examination of the thesis before 30 September 2013.

Please note that I have attached the application form, my curriculum vitae, work permit, residents permit, and research proposal approved by UNISA.

You may contact me on my mobile 71788050/72423365 or my e mail or34956018@my life.unisa.ac.za

You may contact my supervisor: Dr PJ Heeralal, Tel (+27) 012 429-2318, email.

Yours faithfully

Gweshe Murombo Anold

4

THE HEAD

.....

.....

RE: PERMISSION TO CARRY A SURVEY RESEARCH

My name is Gweshe Murombo Anold based at BA ISAGO University College as a lecturer. I am a Doctor of Education (DED) student with the University of South Africa (UNISA), seeking permission to administer a questionnaire to at least five participants with different responsibilities such as lecturers, senior lecturers, HODs, etc. Please find attached copies of (a) approval of dissertation title and (b) research permit issued by the Ministry of Education and Skills Development, Botswana.

The topic is: **"The role of instructional media in tertiary students' conceptualisation of intended learning outcomes in Botswana"** Approved by Higher Degrees committee (UNISA), and my supervisor is Dr PJ Heeralal who can be contacted as follows: Tel: 012 429-2318, email:Heerapj@unisa.ac.za

The aim of this study is to find out what are the perceptions about the role, importance and use of instructional media in tertiary students' conceptualisation of intended learning outcomes.

The objectives of this study are : to examine the effectiveness of instructional media in tertiary students' conceptualisation of intended learning outcomes, to establish the status of instructional media usage at tertiary sector of education, and to justify and verify , if there is a correlation between instructional media and tertiary students' academic achievement.

The purpose of this study is to find out, justify and verify the relevance, usage and impact of instructional media on tertiary students' conceptualisation of intended learning outcomes, and to clear any misconceptions, locally, nationally and globally about the relationship between instructional media and tertiary students' academic achievement, as observed and asserted by Tuckman (1972:295), "There is also a need in education for the establishment and verification of theories or models."

The selection of the sample of participating institutions is purely by stratified random sampling procedure/technique, since these tertiary institutions are stratified by ownership, levels of programme and programme orientation. A minimum of five respondents per institution would be ideal; depending on the size of the institution more respondents may be recruited. **Participants are informed that they have a right to refuse to participate, and withdraw from this study at any given point in time without penalty and prejudice. Your participation in this study is voluntary, and participants are requested to read and sign informed consent, which you can terminate at any time if you wish so. The researcher promises that anonymity, confidentiality and privacy of participants and information is safeguarded by a provision not to identify themselves the participants as indicated on the questionnaire (demographic information of participants).**

The questionnaire has 22 questions; of which 17 questions out of 22, each question may have between two and five responses from where you select one response and tick. The other remaining 5 questions are free response, to give the participant(s) a chance to express their observations, reasons or justification of their selected responses. It also gives you the participant the opportunity to share your personal views and or experiences with the researcher, which would not have been captured by the researcher's coded responses.

The results of this study shall be disseminated to each sampled institution; a hard copy and a soft copy. Apart from this, the other means of dissemination of the research results shall be in accordance to Guidelines for Research, (2007, section 4.6) of the Ministry of Education and Skills Development, Botswana.

You are free to contact me on mobile: 71788050 72423365 73569743, email: anorld.gweshe@gmail.com

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TELEPHONE: 3655469
TELEX: 2944 THUTO BD
FAX: 3185167

REPUBLIC OF BOTSWANA

MINISTRY OF EDUCATION
AND SKILLS DEVELOPMENT
PRIVATE BAG 005
GABORONE

REFERENCE: E1/20/2 XXXI (9)

30th May 2014

Gweshe Murombo Anold
P O Box 30534
F/Town

Dear Madam/Sir

RE: PERMIT TO CONDUCT A RESEARCH STUDY

This serves to grant you permission to conduct your study in the sampled areas in Botswana to address the following research objectives/questions /topic:

The Role Of Instructional Media In Tertiary Students' Conceptualisation of Intended Learning Outcomes In Botswana.

It is of paramount importance to seek **Assent** and **Consent** from Ministry of Education and Skills Development and Regional Directors, Principals, Heads of Departments and Lecturers of selected Tertiary Institutions that you are going to collect data from. We hope that you will conduct your study as stated in your proposal and that you will adhere to research ethics. Failure to comply with the above stated, will result in immediate termination of the research permit. The validity of the permit is from **30th May 2014 to 29th May 2015.**

You are requested to submit a copy of your final report of the study to the Ministry of Education and Skills Development, in the Department of Educational Planning and Research Services, Botswana.

Thank you.

E Ranganai
For/Permanent Secretary

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5 September 2013

Mr Gweshe Murombo Anold
BOX 30534
FRANCISTOWN

Dear Sir

RE: PERMISSION TO CARRY RESEARCH IN TERTIARY INSTITUTIONS

Your letter dated 5th September 2014 on the above subject matter refers.

You are hereby granted permission to carry out research on the role of instructural media in tertiary students' conceptualisation of intended learning outcomes in Botswana at the following schools in our region:

- Gaborone Technical College
- BCET
- Tlokweng Brigade
- Naledi Brigade
- Tswelelopelo Brigade

Wishing you luck.

Yours faithfully

Molatlhegi A
For/Acting Director, Regional Operations

LONG TERM VISION FOR BOTSWANA

This Ministry supports the Vision 2016 in terms of creating **"an educated and informed nation","a prosperous, productive and innovative nation"** and **"an open, democratic and accountable nation"**

7

TELEPHONE 4631820/4632325
FAX 4632324

REFERENCE CREOS/1/13/11 (45)

REPUBLIC OF BOTSWANA

MINISTRY OF EDUCATION AND
SKILLS DEVELOPMENT
REGIONAL EDUCATION
OFFICE (CENTRAL)
PRIVATE BAG 091
SEROWE

23rd September 2014

Mr Gweshe M. Anold
P O Box 30534
FRANCISTOWN

Dear Sir

PERMISSION TO CONDUCT RESEARCH STUDY ON THE ROLE OF INSTRUCTIONAL MEDIA IN TERTIARY STUDENTS' CONCEPTUALISATION OF INTENDED LEARNING OUTCOMES IN BOTSWANA

Please refer to your letter dated 9/9/2014 on the above subject.

Permission is hereby granted for you to carryout the research study in Palapye Technical College, Palapye Brigade, Serowe Brigade, Serowe College of Education, Shoshong Brigade, Madiba Brigade, Mahalapye Development Trust, Selibe Phikwe Technical College, Boteti Brigade and BIUST.

You are requested to give the region the copy of your final report of the study.

Yours faithfully

E. M. Motlhabi
for DIRECTOR, REGIONAL OPERATIONS – CENTRAL

cc: All Chief Education Officers – Central Region

SAVINGRAM

FROM: Acting Director, Regional Operations
South East Region

A. Molatlhegi
For/Acting Director

TEL: 3625000

FAX: 3975899

TO: The Principal
- Gaborone Technical College
- BCET
- Naledi Brigade
- Tswelelopele Brigade
- Tlokweng Brigade

REF: SCRE 1/15/2 IV (150)

5 September 2014

PERMISSION TO CARRY RESEARCH IN TERTIARY INSTITUTIONS: MR GWESHE MUROMBO ANOLD

This communiqué serves to inform you that permission has been granted to the above named person to carry some research in your institution. Mr Gweshe Murombo Anold is a lecturer at Ba Isago University College based at Francistown campus.

The purpose of the study is to address *the role of instructional media in tertiary student's conceptualization of intended learning outcomes in Botswana.*

Kindly give all the support needed..

Thank you.

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SAVINGRAM

FROM : Chief Education Officer
Tonota Sub-Region

Milidzani W. Nduna

TEL : 2484226/977

FAX : 2484769

TO : Principal Tonota College

REF : DEPRS 7/1/5/ XI (14)

27 May 2014

RE: REQUEST FOR A PERMIT TO CONDUCT A RESEARCH STUDY – MR GWESHE MUROMBO ANOLD

The above matter refers.

This serves to inform you to kindly receive Mr Gweshe Murombo Anold from the 17th April 2014 to 16th April 2015, to conduct his study in the sampled areas of Botswana to address the following research objectives/ question/topic:

The Role Of Instructional Media In Tertiary Students' Conceptualisation Of Intended Learning Outcomes In Botswana.

Thank you.

BOTSWANA

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SAVINGRAM

FROM: Chief Education Officer

TEL: 2987334

FAX: 2987234

K.B.HABANA for CEO

TO The Principal

Nkange Brigade

Tutume Brigade

Marobela Brigade

Mosetse Brigade

Nswazwi Brigade

PERMISSION TO CONDUCT A RESEARCH STUDY

This communication serves to inform you that **MR GWESHE MUROMBO ANOLD** has been granted permission to conduct a research study at the above stipulated institutions. You are therefore requested to give him assistance during the course of his research study in your institution.

Thank you

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SAVINGRAM

FROM: Director, Regional Operations
Ministry of Education & Skills Development (North East)

A. K. Matlhape for/DRO

TEL: 2415623/2413181

FAX: 2410838/2415606

TO: Principal – FCTVE
Principal – FCE
Principals
- Zwenshambe Brigade
- Shashe Brigade
- Senyawe Brigade

REF: FRE 1/15/31(13)

26th May 2014

RE: AUTHORITY GIVEN TO CONDUCT RESEARCH

This correspondence serves to request your office to allow **Mr. Gweshe Murombo Anold** to conduct research in your institution as per attached letter from DEPRS.

I hope you will offer him maximum cooperation.

Thank you.

AKM/emresearch Anold

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SAVINGRAM

FROM: Acting Director Regional Operations
Southern Region

G. Ntshiamisang
for/Director

TEL. NO: 5441876
FAX. NO: 5441880

TO: **Principals**

- ✓ Barolong Brigade
- ✓ Lobatse Brigade
- ✓ Kanye Brigade
- ✓ Moshupa Brigade
- ✓ Jwaneng Technical College

REF. NO: SRO 1/5/19 I (39)

5th September 2014

PERMISSION TO CONDUCT RESEARCH

This serves to inform you that **Mr Gweshe Murombo Anold** has been permitted to conduct research in our institutions. Please give him the necessary support.

Thank you very much.

lkl....

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SAVINGRAM

FROM: Director – Regional Operations
Kweneng

R. T. T. Serumola
for/Director

TEL: 5905157
FAX: 5921724

TO: **Principals**
Molepolole College of Education
Kweneng Rural Development Association
Tshwaragano Brigade
Kweneng Bophirima Brigade

REF: KWR 1/24/2 I

5th September 2014

PERMISSION TO CONDUCT RESEARCH

This serves to inform you that **Mr. Gweshe Murombo Anold** has been permitted to conduct research in our institutions. Please give him the necessary support.

Thank you.

RTTS/mm

BOTSWANA

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BELVANS

INSTITUTE

P. O. Box 150010 Tonota Cell: 71319083 Tel/Fax 2484693

02 JULY 2015.

TO WHOM IT MAY CONCERN

Dear Sir/ Madam,

RE: PERMISSION TO DO A RESEARCH AT BELVANS INSTITUTE

This letter serve as a confirmation that **Mr. M.A. Gweshe** student number **34956018** studying for a Doctor of Education (DEd) degree with University of South Africa, **UNISA** carried a descriptive survey of the opinions or attitudes of educators on **"THE ROLE OF INSTRUCTIONAL MEDIA IN TERTIARY STUDENTS' CONCEPTUALISATION OF THE INTENDED LEARNING OUTCOMES IN BOTSWANA** at Belvans institute, Tonota.

For further information, contact our office.

Thank you

Yours faithfully

W.M. Majani

DIRECTOR.

ZWENSHAMBE BRIGADE
P/ Bag 10
MASUNGA

TEL: 2489230
FAX: 2470083

REPUBLIC OF BOTSWANA
Ministry of Education and Skills Development
Department of Technical and Vocational Education

08th July 2015

TO WHOM IT MAY CONCERN

PERMISSION TO CARRYOUT A RESEARCH PROJECT – MUROMBO ARNOLD GWESHE

We would like to confirm that the above named officer requested for permission to to collect data from our lecturers through some questionnaires; on **the Role of Instructional Media in Tertiary students Conceptualization of intended Learning Outcomes in Botswana.**

Permission has been granted for him to execute the duty.

We also wish him the best on his endeavours.

Thank you.

Yours faithfully

K. T. Mukani

For Principal

ZWENSHAMBE BRIGADES
PRIVATE BAG 10, MASUNGA,
TEL: 2489230, FAX: 2489521
08 JUL 2015
DEPUTY PRINCIPAL

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REPUBLIC OF BOTSWANA

MINISTRY OF EDUCATION & SKILLS DEVELOPMENT
Department of Technical & Vocational Education and Training
Shashe Brigade
P/ Bag 84 Tonota
Botswana
Tel:+2484227Fax+2484524

26 June 2015

Mr Gweshe Murombo
BA ISAGO University College
FRANCISTOWN

RE: PERMISSION TO CARRY OUT A SURVEY RESEACH – GWESHE MUROMBO

Your request to carry out the above exercise has been acceded to.

We hope that our lecturers will accord you all the support you need provided all the processes and procedures for research are observed.

Wishing you all the best in your endeavours.

Thank you.

Yours faithfully

S. TAPELA
PRINCIPAL

/ 7

Republic of Botswana

Ministry of Education
& Skills Development

Department of Technical Vocational
Education & training

SEROWE BRIGADES

...a commitment to training with production services.

P O BOX 121 SEROWE
TEL: 4630415
FAX: 4631474

20th August 2015

Mr. Murombo Gweshe
Ba ISAGO University College

Dear Sir

RE: PERMISSION TO CARRY A SURVEY RESEARCH – YOURSELF

Your request to carry out a survey on your project with Lecturers at Serowe Brigades is approved. You may administer your questionnaire with whichever sampled Lecturers willing to offer that assistance.

We hope the study will not only benefit you but all those associated with it.

Thank you.

Yours Sincerely.

Peter O. Nakedi
Principal

THE PRINCIPAL
SEROWE BRIGADES CENTER
23 AUG 2015
P.O BOX 121, SEROWE, BOTSWANA
TEL: 4630415 FAX: 4631474

REPUBLIC OF BOTSWANA
Ministry of Education & Skills Development
Department of Technical Vocational Education & Training

Mahalapye Brigade
Private Bag 16 Mahalapye
Tel: 4710256/219 Fax: 4710375

18 September 2015

To Who It May Concern

Dear Sir/Madam

RE: CONDUCTING A RESEARCH

The above subject matter refers.

This serves to inform confirm the Mr. Arnold Gweshe – a student in your institution conducted a research in Mahalapye Brigade on the 15 September 2015. The topic of the research was **the role of instructional media in tertiary students' conceptualisation of intended learning outcomes in Botswana**

Yours Faithfully,

Oteng Tshimo (Mr)
Head of Satellite

Republic of Botswana

Department of Technical and
Vocation Education and Training
Tutume Brigade
Private Bag 008
Tutume Botswana

Tel/Fax: (267) 2987223/242

09 July 2015

Mr. Marumbo A. Gweshe
P.O. Box 30534
Francistown

Dear Sir

RE: PERMISSION TO CONDUCT A SURVEY RESEARCH

On behalf of the Tutume Brigade Management, I hereby formally give you permission to carry out your research by administering a written survey to our employees. We have informed all members of staff and they are keen to participate.

Thank you.

Yours faithfully

T. Rebaone
For/Principal

TUTUME BRIGADE
PRINCIPAL
2015 -07- 09
P.O. BOX 132 TUTUME
TEL/FAX: 2987223/242

TELEPHONE: (267) 2488 206
SKILLS DEVELOPMENT
FAX: (267) 2488 403
EDUCATION AND TRAINING

REF:

REPUBLIC OF BOTSWANA

MINISTRY OF EDUCATION AND
DEPARTMENT OF VOCATIONAL.
SENYAWE BRIGADE
P. O. BOX 110

30th June 2015

Mr Gweshe Murombo Anold
PO Box 30534
Francistown

Dear Sir

RE: Authority to conduct a research at Senyawe Brigade

By this letter, you are hereby given an authority to conduct your research as per your request.

Wishing you all the best in your exercise.

Thank you.

Mr D. R Morapedi (Head of Satellite)

BOTSWANA

REPUBLIC OF BOTSWANA

MINISTRY OF EDUCATION AND SKILLS DEVELOPMENT
DEPARTMENT OF TECHINICAL AND VACATIONAL
EDUCATION AND TRAINING
NKANGE BRIGADES
PRIVATE BAG 03
NKANGE
BOTSWANA
TELEPHONE: 00(+267) 2986414
FAX: 00(+267)2986463

COMMPETENT AND SELF-RELIANT HUMAN RESOURCE

Mr. Marumbo A. Gweshe
P.O. Box 30534
Francistown

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Dear Sir

RE: PERMISSION TO CONDUCT A SURVEY RESEARCH

On behalf of the Nkange Brigade Management, I hereby formally give you permission to carry out your research by administering a written survey to our employees. We have informed all members of staff and they are keen to participate.

Thank you.

Yours faithfully

T. Rebaone
Head of Satellite

09 JUL 2023

22

TELEPHONE (027) 3655469
TELEX: 2944 THUTO BD
FAX: 3185167

REPUBLIC OF BOTSWANA

MINISTRY OF EDUCATION
AND SKILLS DEVELOPMENT
PRIVATE BAG 005
GABORONE

REFERENCE: DPRS 7/1/5 XX (13)

10 April 2015

Gweshe Murombo Anold
PO Box 30534
Francistown

Dear Sir/Madam

RE: EXTENSION FOR A RESEARCH PERMIT (ref: E1/20/2 XXXI (9).

This serves to extent your permit to conduct your study in the sampled areas in Botswana to address the following research objectives/questions /topic:

The role of Instructional Media in Tertiary students' Conceptualisation of intended Learning Outcomes in Botswana.

It is of paramount importance to seek **Assent** and **Consent** from the Ministry of Education and Skills Development and Regional Directors, Principals, Heads of Departments and Lecturers of selected Tertiary institutions that you are going to collect data from. We hope that you will conduct your study as stated in your proposal and that you will adhere to research ethics. Failure to comply with the above stated, will result in immediate termination of the research permit. The validity of the permit is from **10th April 2015 to 9th April 2016.**

You are requested to submit a copy of your final report of the study as stated in the Research Guidelines (as per article 4.5 and 4.6) to the Ministry of Education and Skills Development, in the Department of Educational Planning and Research Services, Botswana.

Thank you.

A.K.Galeboe
For/Permanent Secretary

MINISTRY OF EDUCATION & SKILLS DEVELOPMENT
P/BAG 005 GABORONE
10 APR 2015
(D.E.P.R.S.)
TEL: 3274559 FAX: 3185167

BOTSWANA
our pride, your destination

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UNISA

23 June 2015

ETHICAL CLEARANCE: MA GWESHE (STUDENT NO. 34956018) – TOPIC : *THE ROLE OF INSTRUCTIONAL MEDIA IN TERTIARY STUDENT'S CONCEPTUALISATION OF INTENDED LEARNING OUTCOMES IN BOTSWANA*

This is to certify that, to the best of my knowledge, Mr MA Gweshe has complied with all ethical issues related to his DEd study on the above topic.

Prof [illegible] Hlalele (supervisor)

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MEMORANDUM

To: To whom it may concern

Subject: **Language editing of a thesis**

Date: 5th November, 2015

I am writing to state that I language-edited the thesis titled: **THE ROLE OF INSTRUCTIONAL MEDIA IN TERTIARY STUDENTS' CONCEPTUALIZATION OF INTENDED LEARNING OUTCOMES IN BOTSWANA** by Murombo Anold Gweshe.

I have prepared a three-page edit report drawing the author's attention to my findings. Additionally, I have made in-text comments for ease of reference. To the best of my knowledge, every aspect of spelling, word choice, grammar, coherence, style, etc. has been highlighted and suggestions for amendments made.

I can confirm that when completed, the standard of linguistic expression in the thesis will meet the stringent requirements for the award of a senior degree.

Yours sincerely,

Prof. D. Kasule (Language Education)
Faculty of Education,
Private Bag 00702
University of Botswana
Tel. +267 3552202 (w), +267 72521182 (c)
Email: kasuled@mopipi.ub.bw