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DIPLOMA IN SCIENCE EDUCATION

Teachers' preparedness in integrating information and communication technology resources and tools in teaching and learning of the mathematics topic 'Transformation'. A case of Townsend high school.

APPROVAL SHEET

This research is presented by Moyo Sithokozile (B1234038) in partial fulfilment of the requirement of Diploma in Science Education in Computer Science (secondary), examined and or recommended for acceptance and approval for oral examination by Supervisor Sunzuma G.

DEDICATIONS

I, specially, dedicate this project to my brother and wife, Luckmore and Taziva Moyo and my husband Joshua Museza, who stood out as a pillar of strength throughout my period of study and their support could not be any better. May the good Lord richly bless them abundantly? Their financial support cannot go unnoticed as they deprived themselves from their desires in order to make this study a success.

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TABLE OF CONTENTS

<u>CONTENT</u>	<u>Page</u>
Title page	1
Approval sheet	2
Dedication	3
Acknowledgements	4
List of tables	7
 <u>Chapter 1</u>	
1.0 Introduction	8
1.1 Background to the study	9
1.2.0 Research problem	9
1.2.1 The purpose of the study	9
1.2.2 Research question	9
1.3 Research objective of the study	9
1.4 Assumptions of the study	10
1.5 Significance of the study	10
1.6 Delimitations of the study	10
1.7 Limitations of the study	10
1.7.1 Ethical consideration	10
1.8 Definition of key terms	11

1.9 Summary	11
-------------	----

CHAPTER 2

2.0 Introduction	12
------------------	----

2.1 Review of related literature	14
----------------------------------	----

a) ICT resources	
b) ICT tools	
c) Benefits of ICT resources and tools	
d) How are they integrating ICT	
e) Factors affecting the integration of ICT	
f) 2.2 Summary	15

CHAPTER 3

3.0 Introduction	16
------------------	----

3.1 Research design	16
---------------------	----

3.2.0 Population, sample and sampling techniques	16
--	----

3.2.1 Population of the study	17
-------------------------------	----

3.2.2 Sample and sampling procedure	17
-------------------------------------	----

3.3. Data collection instruments	17
----------------------------------	----

3.3.0 Questionnaires	18
----------------------	----

3.4 Data presentation and analysis procedures	18
---	----

3.5 Summary	18
-------------	----

CHAPTER 4

4.0 Introduction	19
------------------	----

4.1 Presentation of data and analysis	19
4.3 Summary	25
<u>CHAPTER 5</u>	
5.0 Introduction	26
5.1 Reflection on findings	26
5.2 Recommendations	27
5.3 summary	27
Appendix 1	28
Appendix 2	31
Appendix 3	35

LIST OF TABLES

Table 1; Distribution of teacher respondents by sex

Table 2; Distribution of teacher respondents by experience

Table 3; Distribution of teacher respondents by qualification

Table 4; what are the teachers using ICT for?

Table 5; Distribution of pupil respondents by age and sex

Table 6; ICT resources and tools used by teachers as per pupil's analysis

Table 7; Pupils use of ICT

CHAPTER ONE

1.0 INTRODUCTION

Information and Communication Technology (ICT) tools form an important component in the teaching and learning process (Bhukuvhani C, Zezekwa N, and Sunzuma G, 2011). The researcher is to investigate if teachers are prepared in integrating ICT resources and tools in the mathematics topic transformation. In this chapter several aspects of the research will be highlighted and described. The chapter will look at the background of the study which will be an overview of why the problem observed is a problem. Also the statement of the problem will be formulated which will help in coming up with factors that led to the problem thus also in solving the problem when answered in full. Objectives and the research questions will also be covered in this chapter. Lastly the limitation, delimitations and the summary will be included in this chapter

1.1 BACKGROUND OF THE STUDY

Information and communication technology has changed most people's daily activities in different ways. As these changes are definite amongst the young generation of today's society, they are definite on primary and secondary school students'. Taking into consideration that ICT plays an increasingly import role in the community, especially if we take into account social, economic and cultural role of computers and the internet. If internet and ICT is brought about it can certainly open many opportunities for creativity and improvements, but also for approaching the teaching of transformation to the current generation. This topic includes sub-topics such as translation, reflection, rotation, enlargement, stretch and shear. According to ZIMSEC syllabus on translation involves translation of simple plane figures, reflection: reflect simple plane figures in axes and in any line, rotation: rotate about any point clockwise or anti-clockwise through 90 and 180 degrees Celsius, enlargement: enlarge(s) about any point using a rotational scale factor, stretch: stretch both one way and two way stretch using the axes as the invariant stretch lines and rational stretch factor and shear: using the axes as the invariant lines and rational shear factor. As highlighted in the sub-topics of transformation the use of ICT will be very effective as students might get to see something enlarging on a video or see images rotating using hands on than only by the teacher demonstrating on the chalk board. As from my ordinary level experience my teacher did not teach us this topic as he considered it as a confusing and challenging one, integrating ICT resources and tools will bring up a more positive belief than the present one.

Transformation is somewhat a difficult topic. Students and teachers, both, exhibit serious shortcomings in their understanding of transformations. As per workshop conducted by Mashingaidze (2012) in Mberengwa district, it emerged that transformation as a topic gives techers least pleasure, yet it is considered important in supporting students development of geometric and spatiel thinking (Hollerbrands, 2008). As a result transformation has troubled many teachers and students. Drent (2008) analyzed the content of mathematics sub-disciplines and revealed that there is a difficulty in tactics and procedures of teaching transformation concepts. Accordingly to the 'O' Level examiners reports, questions on transformation are poorly answered (ZIMSEC 2009, ZIMSEC 2010, ZIMSEC 2011 additional math's paper 1 and paper 2 of 2010, UCLES 2013).

Other researchers, (Hudson and Porter, 2010, Noor-Ul-Amin, 2010, Olley and Ngamo, 2006, Douglas, 2010) have reviewed that integrating ICT in teaching and learning is of benefit, hence the need for teacher to be prepared in integrating ICT resources and tools in the teaching and learning of transformation can go a long way in dealing with the above problem since it is an alternative approach available to the students and teacher in the study of mathematics. This makes it valuable to see the sights in which computers, if available and easily reached by both teachers and students, may be used in the teaching of transformation in mathematics.

1.2.0 THE RESEARCH PROBLEM

Transformation is a topic in mathematics which is part of the 'O' Level ZIMSEC examination. This topic is rarely answered by most pupils due to lack of knowledge on it. The researcher intends to investigate on how prepared are teachers in integrating ICT resources and tools in teaching and learning of this topic.

1.2.1 THE PURPOSE OF THE STUDY

The purpose of the study is to find out if teachers are prepared in integrating ICT resources and tools in the topic transformation in mathematics

1.2.2 RESEARCH QUESTION: how prepared teachers are in integrating ICT resources and tools in the topic transformation in mathematics.

Sub-questions

1. How are teachers using ICT resources and tools in teaching and learning transformation?
2. What are the factors affecting the integration of ICT in the teaching and learning of transformation?

1.3 RESEARCH OBJECTIVE OF THE STUDY

The researcher aims to:

- Determine how prepared teachers are in integrating ICT resources and tools in the teaching and learning of mathematics topic transformation.
- Determine teachers and pupils perception on the use of ICT resources and tools in the teaching and learning of mathematics topic transformation.
- Identify challenges met when integrating ICT resources and tools in learning transformation.

1.4 ASSUMPTIONS OF THE STUDY

- The researcher assumes that teaching methodologies have a huge bearing on the pupils mastering of concepts and that the teacher have a role in improving the mastering of a concept by pupils.
- The researcher also assumes that data and information that will be collected from respondents is accurate, relevant and can be relied on.

1.5 SIGNIFICANCE OF THE STUDY

The study envisages inputting into the body of knowledge of mathematics teaching and seeks to see pupils improve in their attempt to impact transformation skills and technique through the use of ICT. With the help of this study, teachers will device appropriate methodologies and techniques to enhance the teaching of transformation through the use of ICT.

The major beneficiary of the study would be the pupils themselves as the outcomes will be implemented to them and make a difference in their learning and mastery of transformation concepts.

1.6.0 LIMITATIONS OF THE STUDY

The study is going to incorporate the set of form three and four students of 2016. Only the mathematics teachers at Townsend are going to be part of the research. The study is also limited at integrating ICT in the teaching and learning of one topic Transformation.

1.6.1 DELIMITATIONS OF THE STUDY

The study is going to be carried out at Townsend High School in Bulawayo Central District of Bulawayo Metropolitan Province. Form three and four makes up the boundary of the study and it is restricted to the 'O' Level mathematics students. The study will be restricted to the preparedness of teachers in integrating ICT resources and tools in the teaching and learning of the topic transformation.

1.7 ETHICAL CONSIDERATION

The results of the personal data collection will be held on high confidentiality by the researcher in order to protect the respondent. The researcher is not going to include any names of the persons who are going to participate as respondent anywhere in the project.

1.8 DEFINATION OF KEY TERMS

Mathematics from Britannica concise encyclopedia, is science of structure, order and relation that has evolved from counting, measuring and describing the shapes of object. It deals with logical reasoning and quantitative calculations.

Transformation is the replacement of the variables in an algebraic expression by their values in terms of another set of variables, a function that changes the position or direction of the axes of a coordinate system.

ICT is technology that supports activities involving information. Such activities include gathering, processing, storing and presenting data (Gokhe 2007).

1.9 SUMMARY

The researcher in this chapter dealt with the background of the study, statement of the problem and objectives of the study. The problem statement and the significance of the study were also discussed. The researcher also highlighted and defined the key terms that are important in clarifying issues within the study. In the next chapter the researcher will focus on the literature review that is related to the research study.

CHAPTER TWO

LITERATURE REVIEW

2.0 INTRODUCTION

This chapter will discuss on the ICT Resources and Tools its advantages and disadvantages. It will also tackle on the barriers to ICT Resources and Tool, and it will focus also on the topic transformation in mathematics what it is all about.

2.1.0 ICT RESOURCES

According to Moursund (2005) ICT is a term that denotes the range of technologies associated with processing information on the one hand and, on the other, with sending and receiving messages. Resources is defined as something one uses to achieve an objective. This implies that ICT resources refers to the technologies associated with making ones' task easy and fast. A few examples of ICT resources includes calculators, phones and computers.

2.1.1 ICT TOOLS

Technology is often treated as a set of available tools in accomplishing one's task in a more efficient way. The same applies to the ICT, which by its nature can be understood as a large array of hardware and software. Some commonly used ICT tools are tool applications: word processing, digital camera, video, and scanner, databases and presentation application (Webb, 1993) in Kibble 2008

2.1.2 BENEFITS OF ICT RESOURCES AND TOOLS IN TEACHING AND LEARNING

In so many way everything has its own advantages and disadvantages. ICT resources and tools also has its own advantages which include, motivation (Balanskat, Blamire and Kefala 2006, Becta 2007,Osted 2004) thus as students will be enjoying the hands on unlike a situation where the teacher will be just explaining upfront. Another benefit of ICT in education is that it expands the availability of resources to teachers and students (Al-Alwani, 2005) in Bingimlas 2009. This also give students and independent learning situations thus they can now research and do given assignments on their own without the need of a teacher all the time(Balanskat et al 2006). At the same time it makes learning more effective, involving more senses in a multimedia context and more connections in a hyper media context (Balanskat et al 2006). However on the part of teachers time is saved and productivity increased in preparing and updating daily lessons. According to Brush, Glazewski and Hew (2008) have stated, ICT is used as a tool for students to discover learning topics, solve problems, and provide solutions to the problems in the learning process. ICT make knowledge acquisition more accessible and concepts in learning areas understood while

engaging students in the application of ICT. Koc (2005) mentioned that using ICT enables students to communicate, share and work collaboratively anywhere, any time. For instance, a teleconferencing classroom could invite students around the world to gather together simultaneously for a topic discussion. Students will not only acquire knowledge together but also share diverse learning experiences from one another in order to express themselves and reflect on their learning. As enlightened by Mashingaidze(2012) using ICT in teaching transformation gives the learner better data handling skills to interpret and sketch graphs. Concept of transformation has concrete manifestation in ICT since the computer has the capacity to tell shear, reflection so ideas become tangible to the learner. Computers as elaborated by www.aiijssnet.com/journals 27/01/16 21.06 has the ability to discover and play down abstract like transformation hence handling of data and creation of graphs which may come from speedy ICT tools and with the teachers help makes exploration of transformation meaningful and relevant. ICT also Improves accuracy and reduce errors in plotting shapes in transformation (Cosette 2004). Can bring the learners in a virtual environment by demonstrating on power points concepts like shear. Cosette (2004) also highlights that the use of ICT leads to added abilities for self-regulated learning and reduces stigma towards the concept of transformation as a topic in mathematics.

2.1.3 HOW ARE THEY INTEGRATING ICT IN THE TEACHING AND LEARNING?

Clausen- May (2008), says the use of ICT in the mathematics classroom has long been a topic of consideration by mathematics educators. The examples of these ICT tools used in mathematics includes: portables, graphic calculators and computerized graphing, specialized software, programmable toys or floor robots, spreadsheets and databases. Studies carried out by Douglas (2010) indicates that most people now have portable devices which allow them to collect data and manipulate it using spreadsheets for work in numeracy. The use of graphic calculators and computerized graphing in mathematics has made it possible to speed up teacher's work (Hennessy 2001, Clements 2000). Becta (2007) has also indicated that teachers are using ICT for communication with other teachers from other schools so they can get the teaching materials. Koc (2005) mentions that pupils are using ICT to communicate with one another so as to get and share important work for instance through telecommunication. Pupils are also using this ICT in discovering new knowledge to add to the one they have been taught by their teachers (Mishra and Koehler, 2006).

2.1.4 FACTORS AFFECTING THE INTEGRATION OF ICT RESOURCES AND TOOLS IN TEACHING AND LEARNING

Lack of resources

The main barrier to ICT resources and tools is the limited access to ICT due to the lack or poor organization of ICT resources, poor quality and inadequate maintenance of hardware as well as unsuitable educational software are also defining elements in teachers' levels of ICT use Balanskat

et al (2006). Lack of resources might include lack of insufficient computers, peripherals, and software hence using ICT in teaching transformation becomes difficult (Karagiorgi 2005)

Lack of specific knowledge

The lack of specific knowledge and skills, technology-supported-pedagogical knowledge and skills has been identified as a major barrier to technology integration. Lack of specific technology knowledge and skill is one of the common reasons given by teachers for not using technology Brush, Hew (2007). Link.springer.com 27/01/16 21.15 indicated that teachers are lacking professional development for pre-service in ICT such that they gain knowledge on how to apply ICT in teaching of transformation. Forgasz (2006), states that lack of training opportunities for ICT use in classroom situation is preventing teachers in using it when teaching transformation.

Institutional barrier

Institutional barriers may include, leadership, school time-tabling structure and school planning (Jones 2002). Research has indicated that leadership can hinder the integration of technology by teachers.

Teacher's belief

Fox and Henri (2005) found that the majority of teachers hold beliefs about mathematics that may influence how they teach or structure the learning environment, teachers also hold beliefs about the use of technology. For example the studies conducted by Li(2007); Kynigos and Argynis (2004) on the beliefs about technology use in the mathematics classroom portrayed some difficulties in the different aspects of learning situations in different ways, and the impact of using computers on their beliefs about teaching mathematics. Li's (2007) study reveals contrasting beliefs between students and teachers. For example, the students commented that they wanted to learn in a more effective, efficient and fun way, which suggests that technology, may help weak students increasing their confidence levels. On the other hand no teacher is the study considered the advantage of computer technology as an alternative to the traditional approach of teaching to improve weak students' learning. Kynigos and Argyris (2004) study established the complexity of issues that play a pertinent role in forming beliefs and practices in the aspects of teacher intervention in in the classroom. As most teachers believe mathematics is easily taught using a chalk and a chalkboard, www.aiijssnet.com/journals 27/01/16 21.06 says computer attitude has a need to be corrected on teachers such that they are comfortable with the use of ICT in teaching transformation and the belief that ICT use is time consuming.

2.2 SUMMARY

This chapter reviewed literature on what other authorities are saying about the research problem, the literature was divided into subsections that were derived from the research questions. The

research is intended to close the gaps left by other researchers on the research problem by reviewing their view about the problem.

CHAPTER THREE

RESEARCH METHODS/DESIGN

3.1 INTRODUCTION

Chapter three is organised around the research design, population of the study, sample and sampling procedures, research instrument, data collection procedures and data presentation and analysis procedures.

3.1 RESEARCH DESIGN.

The question most researchers ask is, what exactly is a research design? Burns and Bush (1998:110) says “a research design is a set of decisions that make up the master plan specifying methods and producers for collecting and analyzing the needed information”. It provides information of what to gather, from whom, how and when to collect the data and how to analyze the data obtained. It is a “blue print” that specifies exactly how the study was carried out.

To investigate how teachers are using ICT resources and tools in teaching and learning transformation and on what are the factors preventing them in integrating ICT the study will employ a quantitative research design. Hay, et al (2012) state that the general purpose of quantitative research is to collect and analyze data, to explain, predict or control phenomena or interest. Quantitative research is all about the need to control and minimize intervening factors or variables on the outcome of research. According to Mountain and Marais (1990) the advantage of using a quantitative research is that it is explicitly controlled and has a large sample size which gives more information as far as value statics are concerned. The data that will be obtained from the research will make it easy to compile it into charts or graphs because numbers will be available.

3.2.0 POPULATION, SAMPLE AND SAMPLING TECHNIQUE

3.2.1 POPULATION OF THE STUDY

Best and Khan (1993) defines population as, "a group of individuals that have one or more characteristics in common, that are of interest to the researcher." In this research population refers to the group of pupils and teachers the researcher will work with in carrying out the research. The

population for the study will be the O 'level Form 3 and 4 pupils and mathematics teachers at Townsend High School.

3.2.2 SAMPLE AND SAMPLING PROCEDURE

Kasambira (1997) views sampling as a deliberate rather than a haphazard method selecting the subjects for observation. A sample is a portion of the whole population that is actually selected for a study since the researcher cannot accurately enumerate characteristics of the whole population. Haralambos (1985:157) agrees that a sample is indeed a portion that is selected for study or testing. Sampling means choosing a few people from a large group for research purpose. It also implies that sampling has various functions such as enhancing accuracy, saving time and easy to manage.

Upon consideration of the above opinions the researcher has chosen stratified sampling in selecting the sample. The researcher chose to use the two forms in her sample. The class is made up of 40 of which 16 Of the pupils do computers as a practical. The researcher is to group pupils according to their age from 15 to 18 and each age is to be represented according to the ratio of its total. Out of 128 pupils who do computers the researcher will choose the 30 pupils.

3.3.0 DATA COLLECTION INSTRUMENTS

The American Heritage Dictionary (2009) defines data as information about a sample and collection as gathering information. Gofton and Mitchel (1997:23) define data collection as involving a range of diverse possibilities- they say that “ it is not a recipe but a cook book which can be improved and extended”. The American Heritage Dictionary (2009) defines data as information about a sample and collection as gathering information. Researcher need to choose the most effective data collection instruments to gather enough and usable data. For this study the researcher will use questionnaires, as data collection instruments.

3.3.1 QUESTIONNAIRES

These Questionnaire is the most frequently, very concise, pre-planned set of questions designed to yield information to meet a particular need for research information about a pertinent topic (Key, 1979). Thus, it is a means of eliciting the feelings, beliefs, experiences, perceptions or attitudes of some individuals. Self-administered questionnaire containing both closed and open-ended questions will be utilized, to gather some of the data. Inclusion of open-ended questions provided for the expression of respondents' views and understanding of issues as well as explanation for answers given to closed questions. The nature of the data that answers the

research questions requires the use of a questionnaire (Vaac and Bright, 1999). According to Belvedere Teachers' College handbook (2000:21-22), questionnaires are "... a list of questions comprising of structured or closed questions and open questions which respondents are asked to give their views through writing or filling in". Questionnaires have been adopted for this research for the following reasons:

- They get general overviews of attitudes and experiences from the respondents.
- They are objective and save time
- They give a wider coverage of respondents
- They are easy to administer
- Less travelling costs are incurred
- There is written record.

3.4 DATA PRESENTATION AND ANALYSIS PROCEDURE

The researcher distributed questionnaires to the maths teachers and selected pupils. Selected female pupils were given questionnaires and the data was analysed and presented in form of graphs and tables.

3.5 SUMMARY

The chapter describes the research methodology, to be used to provide data and to investigate the research problem. This is divided into research design, population of the study, sample and sampling procedures, research instruments, data collection procedures and data presentation and analysis procedures.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.0 INTRODUCTION

In the previous chapter, the researcher looked at population, sampling and instruments of collecting data. This chapter focuses on presentation, analysis and interpretation of the data gathered through questionnaires that were distributed at Townsend High School in Bulawayo Central District. Data was collected from a sample of 30pupils and six mathematics teachers and presentation of results was done in form of tables and graphs.

4.1 DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS

Thirty-six questionnaires were personally administered to students (30) and mathematics teachers (6) at Townsend High School. The questionnaires were confidently answered by students and teachers. These were issued during lunch time so as not to disturb the running of the school.

TABLE 1: DISTRIBUTION OF TEACHER RESPONDENTS BY SEX (N=6)

AGE RANGE (years)	SEX			
	FEMALE		MALE	
	(N)	(%)	(N)	(%)
Below 22	0	0	0	0
22-32	1	16.7	1	16.7
33-43	2	33.3	1	16.7
Above 53	1	16.7	0	0

The table is indicating that they are more lady mathematics teachers than the male. Two (33.4%) teachers a male and a female are of the age between 22-32 years of age, three (50%) teachers,

two females and a male are of the age between 33-43years of age and one (16.7%) of the eldest female teacher is above the age of 53years. This shows that the data was gathered from mature age group and it implies that the results are reliable.

TABLE 2: DISTRIBUTION OF RESPONDENTS BY TEACHING EXPERIENCES (N=6)

Teaching experience range years	(N)	(%)
0-5	2	33.3
6-10	2	33.3
11-15	1	16.7
16-20	0	0
Above 20	1	16.7

Table 2 shows that respondents 2 (33.3%) are below 5 years teaching experience, 2 (33.3%) have 6-10 years' teaching experience, 1 (16.7%) has 11-15 years teaching experience and 1 (16.7%) of the respondents have taught for more than 20 years. These results highlight that the all teachers in the sample study have teaching experiences. The largest percentage of the population has taught for more than 5 years and this implies that the respondents have necessary experiences in the teaching field and therefore have come across more O' level students who have written mathematics.

TABLE3: DISTRIBUTION OF TEACHER RESPONDENTS BY QUALIFICATION AND PLACE OBTAINED (N=6)

Qualification	Male	female	Place obtained
Certificate in education		1	Gweru teachers college
Diploma in education	1	2	(2) hillside teachers college (1) Belvedere Technical teachers college

Degree in education		1	NUST
Bsc (HONS) operations research and statistics	1		NUST

From the findings most of the teachers have done a qualification basing on education. This implies they know different ways that they can use in teaching different topics. Also the research indicated that all the teachers are furthering their education which means they are all trying to inquire more knowledge on how best they can teach their students.

TABLE 4: WHAT ARE THE TEACHERS USING ICT FOR? (N=6)

USES	Frequency (%)
Researching for lesson	66.7
Communication for information	83.3
Preparing a lesson	33.3
Word processing	33.3
Publishing educational materials	16.7
Emailing educational materials	0
CD-ROM	16.7
Using internet personally	83.3
Playing games	66.7

The research findings have indicated that teachers are using ICT much in communicating with other teachers for more information and also for personal use. There is no use at all of ICT in emailing educational material. There is less use of ICT in publishing educational materials and the CD-ROM.

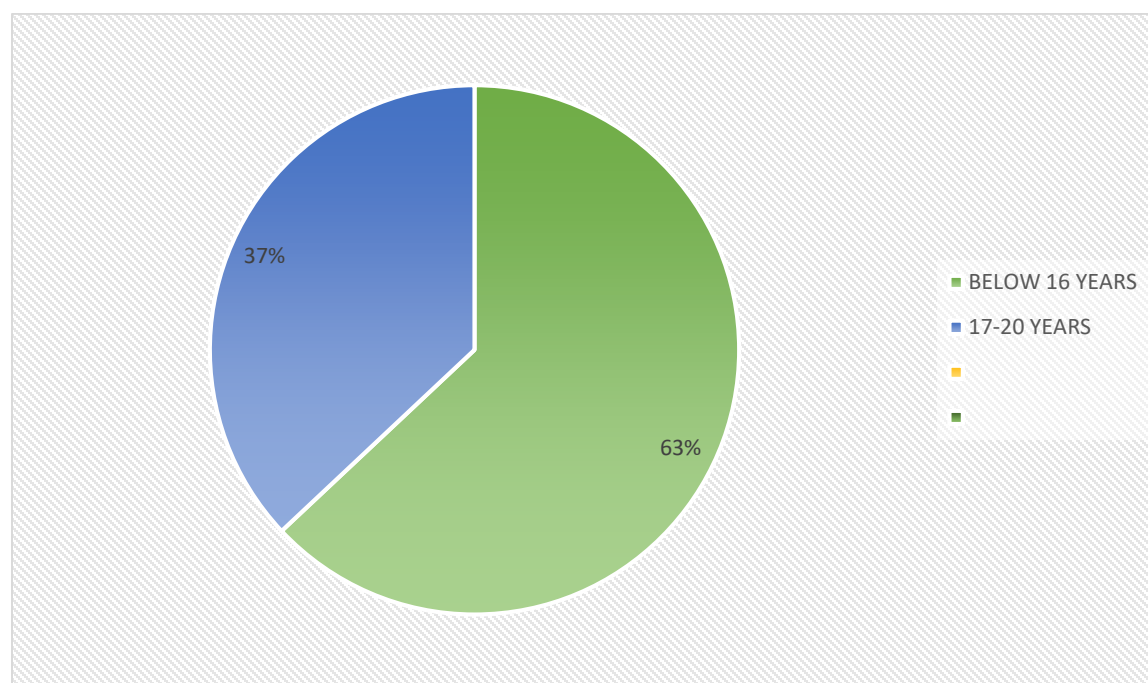
4.2 FACTORS AFFECTING TEACHERS IN INTEGRATING OF ICT (N=6)

Teachers believe that shortage of labs and few ICT technical support from school administration (83.3%), little access to ICT and lack of resources (100%), lack of software (66.7%) is mostly affecting the integration of ICT in the teaching and learning of mathematics topic transformation. However they also indicated that colleague's negative views about ICT (33.3%), time needed to learn ICT (16.7%) and lack of qualification (50%) has less effect on the factors affecting the integration of ICT.

TABLE 5: DISTRIBUTION OF STUDENTS RESPONDENTS BY SEX AND AGE
(N=30)

AGE RANGE	SEX	
	FEMALE	
	(N)	(%)
Below 16	19	63
17-20	11	37

PIE CHART SHOWING AGE RANGE OF THE PUPIL RESPONDENTS





GRAPH 1: SHOWING AIDS USED BY TEACHERS TO TEACH MATHEMATICS (N=30)

TABLE 6: ICT RESOURCES AND TOOLS USED BY TEACHERS AS PER PUPILS ANALYSIS (N=30)

TOOLS AND RESOURCES	YES	SOMETIMES	NEVER
LAPTOP	10	12	8
WHITEBOARD	9	15	6
PROJECTOR	9	12	9
DIGITAL CAMERA	5	7	18
DIGITAL RECORDER	5	9	16
ON-LINE RESOURCES	8	6	16
CD-ROM	8	8	14
EXTERNALLY PRODUCED SOFTWARE			30

INTERNALLY PRODUCED SOFTWARE	3	5	22
WORD PROCESSING	6	4	20
SPREADSHEETS	5	8	17

From the graph and the table it is indicated that the chalkboard and charts is the mostly used aid by most teacher. ICT tools and resources are sometimes used instead of being used every time as the time that we are living in is currently requiring. However most pupils indicated that teachers are making an effort of using ICT as most of the time they use their own machinery as the school ones are only mandatory to those who do computers as a subject and are not even enough for them. Adding on to the chalk and board 66.7% of students suggested that the more frequent use of projector, laptop and online resources would help them understand as they can contribute to buy CDs and copy the information for further use at home. However others are satisfied with the chalk and board as they said it's a cheap resource for the school.

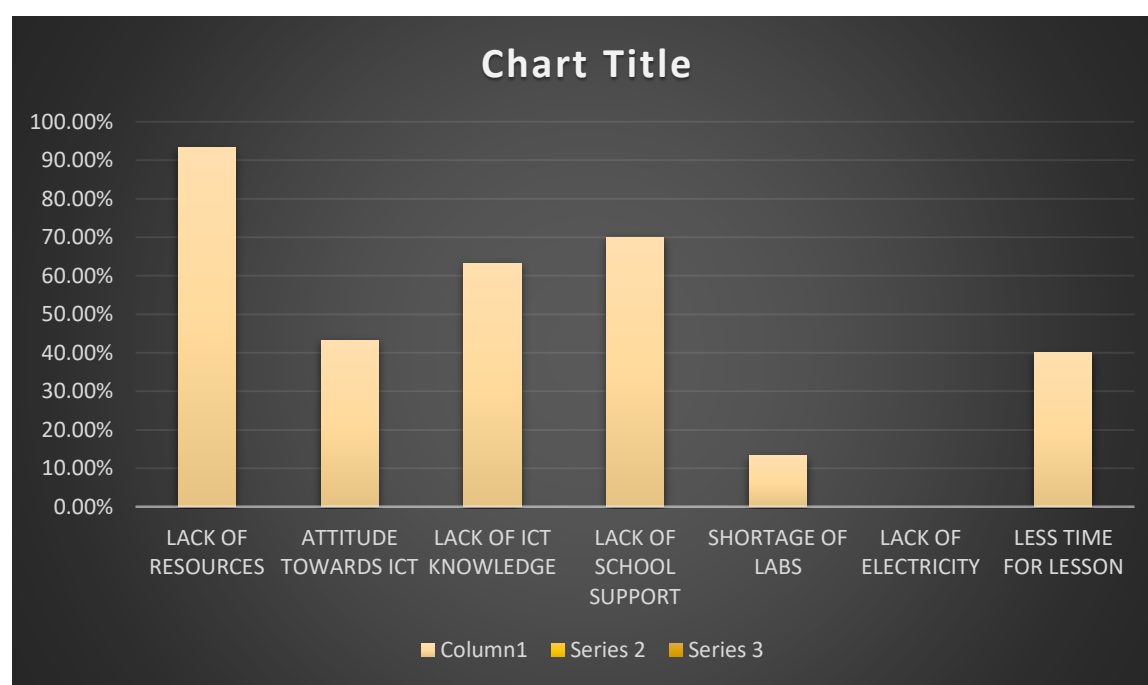
TABLE 7: PUPILS USE OF ICT (N=30)

The research showed that most pupils (83.3%) are exposed to ICT due to different modern cell phones they use and a few (16.7%) are less exposed.

ICT USE	FREQUENCY (%)		
	YES	SOMETIMES	NEVER
Researching for class task	26.7	33.3	40
Communicating with others for information	50	26.7	23.3
Preparing for presentations	16.7	13.3	70
Word processing	23.3	23.3	53.4
Publishing educational materials	13.3	6.7	80
Downloading movies	33.3	46.7	20
Playing educational CD	13.3	23.3	63.4
Playing games	86.7	6.7	6.6

The results shows that most pupils use ICT to play games (86.7%) and also on communicating with others for educational information (50%). It is also highlighted that most pupils have never used ICT for preparing for presentations (70%) and also for publishing educational materials (80%). According to pupils they said the reason that they never frequently use ICT is they do not have free access to the school computers if they are not having a computer lesson. The other issue was even at home their parents are unable to recharge their phones every day for school use.

GRAPH 2: FACTORS AFFECTING INTEGRATION OF ICT RESOURCES AND TOOLS AS PER PUPILS VIEW (N=30)



The graph shows that the high percentage of pupils believe that lack of resources has a high effect on ICT followed by lack of school support, lack of ICT knowledge and attitude towards ICT. However lack of labs has less effect as far as integration of ICT is concerned. Pupils believed that the school has enough electricity hence they find it as not a barrier to integration of ICT.

4.3 SUMMARY

On this chapter the researcher presented data collected from the previous chapter. Analyses and discussion on the data was carried out and the data was presented using tables and graphs.

CHAPTER FIVE

5.0 INTRODUCTION

The previous chapter focused on data presentation and analysis. There was also discussion and interpretation of themes and patterns arising from the data. On this chapter the researcher is to look at the reflections and findings and also draw conclusions on the findings. This chapter also seeks to find solution and answers to the research questions.

5.1 REFLECTIONS OF FINDINGS

From this research, the researcher found out that most of the teachers are using ICT resources and tools like

- Laptops, whiteboard, projector, word processing sometimes rather than always
- Digital camera and externally produced software has never been used
- Whiteboard even when available they are not frequently used.

The findings also reflected that most of the ICT tools and resources are not being used by teacher most frequently due to them not being available for every teacher to use. Even though the school has about twenty computers these are restricted mainly to the computers teachers and his/her pupils who do computer as part of their subjects.

Most of the teachers noted that even though they sometimes get hold of the ICT equipment's they have never used it for the purpose of publishing educational materials but they rather use the opportunity to communicate with other teachers so they can get more information on how to teach transformation to their pupils. Teachers also noted that they sometimes use ICT for researching for a lesson, playing educational CD, playing games and they acknowledged that most of the time they are accessing internet it's for their personal use rather than for their work.

The researcher also managed to gather different factors affecting the integration of ICT resource and tools in the teaching and learning of a topic transformation in mathematics. According to the response of teachers and pupils they both strongly agreed that lack of resources, little access to ICT, lack of software and lack of school support is making it difficult for them to use ICT resources and tools in their day to day teaching and learning of transformation in the classroom. However teachers and pupils could not come up with the same agreement on lack of labs as teachers strongly agreed that it was a factor contributing to them not using ICT but students noted that it does not need a lab for them to implement ICT but resources. Both the teachers and pupils agreed that the time for the lesson and lack of qualification does not affect the integration of ICT that much.

5.2 RECOMMENTATIONS

For fully utilisation of the advantages brought in by the integration of ICT resources and tools specifically in the teaching and learning of the topic transformation in mathematics there is need for the school to support the use of ICT in the teaching and learning hence making resources available. The teachers also should pursue on computer courses so as to have full knowledge on how to use ICT if the software to teach transformation is made available.

Learning using ICT does not only happen in a computer lab but teachers can pursue the school committee to place WIFI that can be accessed in any class and each class to be bought a computer and the required software for teaching transformation, the projector and a white board. As teachers get used to teaching using ICT their attitude towards it will eventually change to a positive one.

All classroom activities should be based on computer technology. Teachers should publish, design, create and present educational products using the current technology resources and tools that establish and link educational concepts to pupils inside and outside the learning environment for them to appreciate the benefits of ICT in their learning.

Finally, the researcher encourages all stakeholders in Mathematics fraternity to collaborate on the integration of ICT resources and tools in the teaching and learning, give enough support and guidance to solve the factors affecting the integration. Education officer for the subject, Mathematics, should organise workshops for subject teachers regularly on how to use ICT resources and tools in the teaching and learning of various topics, especially transformation. This can be done at provincial, district or even at cluster level.

5.3 SUMMARY

The chapter focused on the reflections on the findings of the study and recommendations made by the researcher.

APPENDICES

APPENDIX 1

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APPENDIX 2

QUESTIONNAIRES FOR THE MATHEMATICS TEACHERS AT TOWNSEND HIGH SCHOOL.

I am a final year, Diploma of Science Education student at Bindura University of Science Education carrying out a study on the preparedness of teachers in integrating ICT tools and resources in teaching and learning of the topic Transformation in mathematics. A case at Townsend High school. Your honest opinion will be of much value. Your answers to this questionnaire will remain strictly confidential as no name will be needed on any of the questions.

Your cooperation will be greatly appreciated.

Instructions

Kindly answer all questions. Do not discuss with anyone. Please respond to items below by putting a tick in the provided space and elaborate when requested to do so.

SECTION A

1. Sex ☐ Female ☐ Male
2. What is your age range? Below 22 ☐ ☐ 22-32 years ☐ 33-43 ☐ above 43years
3. Teaching experience ☐ 0-5 ☐ 6-10 ☐ 11-15 ☐ 16-21 ☐ 21-25 years ☐ above 25years.

SECTION B

Qualification	
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Diploma in teaching	
Degree in teaching	
Masters in teaching	
Phd	
Any other (indicate name)	

Please indicate place the qualification was obtained;

Please indicate if you furthering your study and which level are you doing?

Do you have any computer qualification? Yes [] No []

SECTION C

What are you using ICT for?

USES	YES	SOMETIMES	NEVER
Researching for a lesson			
Communication with other teachers for information			
Preparing a lesson			
Word processing			
Publishing educational materials			
Emailing educational materials			
Accessing internet			
Using educational CD			

Playing games			
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For all the answers indicated never please give a reason?

Is WIFI available at school? Yes [] No []

If yes is it free for every teacher to use?

Give a reason for your answer

SECTION D

Factors affecting integrating of ICT

FACTORS	AGREE	STRONGLY AGREE	DISAGREE	STRONGLY DISAGREE
1. Shortage of lab				
2. Little access to ICT				
3. Lack of resources (Computers)				
4. Few ICT technical support from school discourages me				
5. Colleagues negative views about ICT				
6. Time needed to learn ICT				
7. Lack of qualification- knowledge				
8. Lack of software				

If all the factors not there do you think teaching transformation using ICT will help? Yes []

No []

Give at least three reason for your answer?

THANK YOU FOR YOUR COOPERATION.

QUESTIONNAIRES FOR PUPILS AT TOWNSEND HIGH SCHOOL.

I am a final year Diploma of Science Education student at Bindura University of Science Education carrying out a study on the preparedness of teachers in integrating ICT tools and resources in teaching and learning of the topic Transformation in mathematics. A case at Townsend High school. Your honest opinion will be of great value. Your answers will remain strictly confidential as no name will be required on any question.

Instructions

Kindly answer all questions. Do not discuss with anyone. Your answers to this questionnaire will remain strictly confidential. Please respond to items below by putting a tick in the provided space and elaborate when requested to do so.

SECTION A

1. Sex [] Female

2. What is your age range? Below 16 [] [] 17-20

SECTION B; AIDS USED BY TEACHERS

AIDS	AGREE	STRONG LY AGREE	DISAGR EE	STRONG LY DISAGRE E
Chalkboard only				
Chalkboard and charts				
1 textbook				
Different textbook				

ICT RESOURCES AND TOOLS USED BY TEACHERS

TOOLS AND RESOURCES	YES	SOMETIMES	NEVER
Laptop			
White board			
Projector			
Digital camera			
Digital recorder			
Online resources			
CD-ROM			
Externally produced software			
Internally produced software			
Word processing			
Spreadsheets			

Of the used AID which one do you think would help you understand better if used?

Give a reason for your selection:

SECTION C: What are you using ICT for?

USES	YES	SOMETIMES	NEVER
Researching for class tasks			

Communicating with other students for information			
Preparing for presentations			
Word processing			
Publishing educational materials			
Emailing			
Accessing internet			
Downloading movies			
Using educational CD			
Playing games			

For all the answer given as never, please indicate a reason

SECTION D: FACTORS AFFECTING INTEGRATING

CAUSES	AGREE	STRONGLY AGREE	DISAGREE	STRONGLY DISAGREE
1. Lack of resources (computers)				
2. Attitude towards use of ICT				
3. Lack of ICT knowledge				
4. Lack of school support				
5. Shortage of classroom				
6. Lack of electricity				
7. Less time for the lessons				

As pupils would you like to use computers in the learning of the topic transformation in mathematics? Yes () No ().

Give a reason for the above suggestion:

THANK YOU FOR YOUR COOPERATION.

