



**EFFECTS OF CURRICULUM CHANGES ON MATHEMATICS TEACHING AND
LEARNING IN FOUNDATION PHASE IN SIBASA CIRCUIT**

BY

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DECLARATION

I, **Thivhonal Agnes Ndadza**, hereby declare that the dissertation, “**Effects of curriculum changes on mathematics teaching and learning in foundation phase in Sibasa circuit**” is my own work and all sources that I have used,

have been indicated and acknowledged by means of complete references.

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

Thivhonal Agnes Ndadza

DEDICATION

This study is dedicated to the following people:

My husband, Ndadza Namadzavho Bethuel for always encouraging me to keep on working even if the circumstances were not favourable. He would say: **“My wife, wake up and do the work that you told me about concerning research matters.”** May God give you some more days to live?

- Ndadza Mudodzwa, my granddaughter, who encourage by merely sitting there while I am working.
- My two sons, Ndadza Ndivho and Ndadza Mukondeleli, who trust me because they always say: **“We want to see you one day being a doctor in education.”**

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- The Department of Basic Education in Limpopo Province, especially in Vhembe District, under Sibasa circuit
- Teachers who gave me a chance to work with them in a harmonious way while collecting data, I would like to say to them: **“I really enjoyed your hospitality.”**
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- Finally, **“Blessed be God, who has not turned away my prayer for a success, nor denied me His mercy.**

ABSTRACT

This study investigated the effects of curriculum changes on Mathematics teaching and learning in foundation phase, in Sibasa circuit, in Limpopo province. The study made use of a qualitative approach by means of interviews. Purposive sampling was utilised to select participants for this study. Results show that: policy makers failed to involve different stakeholders before introducing the new curriculum, the department did not regularly convene workshops, seminars, and conferences and even continued trainings for Mathematics teachers; there is lack of teacher learner support materials that makes changes in curriculum and affects teaching and learning in a negative way.

Key words: curriculum, effects, environment, foundation phase, implementation, learning and outcomes based education.

ACRONYMS

B.ED	-	Bachelor of Education
C2005-		Curriculum 2005
CAPS	-	Curriculum and Assessment Policy Statement
Cass	-	Continuous Assessment
CDE	-	Centre of Development and Enterprise.
COSA	-	Constitution of South Africa
DOBE	-	Department of Basic Education
HSRC	-	Human sciences Research council
INTO	-	Irish National Teachers Organisation
IQMS	-	Integrated Quality Management System
JPTD	-	Junior Primary Teachers Diploma
LTSM	-	Learners Teacher support Materials
M.ED	-	Masters of Education
NCS	-	National Curriculum Statement
NECT	-	National Education Collaboration Trust
NGO	-	Non-governmental Organisation
NQF	-	National Qualification Framework
OBE	-	Outcomes-based Education
PCSP	-	Primary Curriculum Support Program
PTD	-	Primary Teachers Diploma
RNCS	-	Revised National Curriculum Statement
SGB	-	School Governing Body
SMC	-	Singapore Mathematics Curriculum
SMC	-	School Management Committee

SMT	-	School Management Team
STD	-	Senior Teacher Diploma
TRC	-	The Revised Committee
UoZ	-	University of Zimbabwe
ZPD	-	Zone of Proximal Development

TABLE OF CONTENTS

	Pages
Declaration	i
Dedication	ii
Acknowledgements	iii
Abstract	iv
Acronyms	v

CHAPTER 1

1.1 .INTRODUCTION	1
1.2. PROBLEM STATEMENT	3
1.3. AIM OF THE STUDY	4
1.4. OBJECTIVES OF THE STUDY	4
1.5. RESEARCH QUESTIONS	4
1.6. RESEARCH DESIGN AND METHODOLOGY	5
1.6.1. Research paradigm	5
1.6.2. Research approach	5
1.6.3. Research methodology	6
1.6.4. Population	7
1.6.5. Sampling procedure	7
1.6.6. Data collection procedure	8
1.6.7. Data analysis procedure	8

1.6.8. Ethical and safety issues	11
1.7. KNOWLEDGE DISSEMINATION	11
1.8. PRELIMINARY CHAPTER DIVISION	12
1.9. CHAPTER SUMMARY	13
CHAPTER 2: LITERATURE REVIEW	
2.1. INTRODUCTION	14
2.2 .THEORETICAL FRAMEWORK	14
2.3. FACTORS AFFECTING CURRICULUM CHANGES OF MATHEMATICS TEACHING AND LEARNING	
2.3.1. Approaches to teaching and learning	17
2.3.2. Teacher's belief towards curriculum change	18
2. 3.3. Effects of curriculum changes towards teacher development	19
2.3.4. Effects of financial constraints towards curriculum implementation	20
2.3.5. Learner-teacher support materials	21
2.3.6. Monitoring and evaluation	21
2.2.7. Parental involvement in mathematics teaching and learning	22
2.3.8. Teacher-learner ratio and over crowdedness	23
2.3.7. The language issue in mathematics teaching and learning	24
2.3.9. The knowledge base for teaching and learning of mathematics	25
2.4. THE AFFECTS OF CHANGES IN MATHEMATICS CURRICULUM IN THE FOUNDATION PHASE	
2.4.1. Effects of Curriculum 2005 on teaching and learning mathematics in Foundation phase	26
2.4.2. Effects of the Revised National Curriculum Statement on mathematics And learning in foundation phase	28
2.4.3. The effects of the Curriculum and Assessment Policy Statement	29

2.5. UNDERSTANDING THE NATURE OF CHANGES IN MATHEMATICS	
CURRICULUM	30
2.6. SUMMARY	32
CHAPTER 3	
3.1 INTRODUCTION	33
3.2 AIM OF THE STUDY	33
3.3 OBJECTIVES OF THE STUDY	33
3.4. RESEARCH QUESTION	34
3.5. RESEARCH DESIGN AND METHODOLOGY	34
3.6. RESEARCH PARADIGM	34
3.7. RESEARCH APPROACH	35
3.8. RESEARCH METHODOLOGY	35
3.9. POPULATION	36
3.10. Sampling procedure	36
3.11. Data collection procedure	38
3.12. Data analysis procedure	39
3.13. Ethical and safety issues	41
3.1.4. Reliability	43
3.1.5. Summary	43
CHAPTER 4: RESULTS AND DISCUSSION	
4.1. INTRODUCTION	44
4.2. INTERPRETATION AND ANALYSIS	44
4.3. DEMOGRAPHIC INFORMATION	44
4.3.1. Gender	45

4.3.2. Years of teaching experience	45
4.3.3. Qualifications	46
4.4. ANALYSIS OF CONTEXTUAL QUESTIONS	47
4.4.1. Themes and Sub-themes	47
4.4.2. Theme 1: Teachers view on curriculum changes	50
4.4.2.1. Lack of involvement in curriculum change decision making	50
4.4.2.2. Administration of teaching activities	52
4.4.2.3. Resistance to change in methods of teaching and learning	53
4.4.2.4. Teacher-learner support materials	54
4.4.2.5. Teacher preparedness to accept change	55
4.4.2.6. Teachers lack of confidence	56
4.4.3. Theme 2: Monitoring and evaluation in the Implementation of the curriculum.	
4.4.3.1. School management	58
4.4.3.1.1. School management knowledge regarding new learning areas	
In mathematics	58
4.4.3.1.2. Class visits by school management	61
4.4.3.2. Mathematics curriculum advisors support	62
4.4.3.2. Parental support	64
4.4.3.2.1. Parent supervision of their children's work	64
4.4.3.2.2. Attending subject meetings	65
4.4.3.2.3. Learner absenteeism	67
4.4.3.2.3. Late arrival to school	68
4.4.3.3. Learner support from community	69
4.4.4. Theme 3: Teacher training and development	71

4.4.4.1. Inadequate training	71
4.4.4.2. Teacher self-identified needs	72
4.4.4.3. Curriculum advisors support	75
4.4.4.4. Follow up visits of curriculum advisors after workshop	75
4.4.4.5. Teacher competent within the new changes	76
4.4.4.6. Continuous training	77
4.4.5. Theme 4: Increased class sizes and workload	78
4.4.5.1. Teacher-learner ratio over crowdedness	78
4.4.5.1.1. Individual attention	79
4.4.5.1.2. Class size management	81
4.4.5.1.3. Time allocated for mathematics lessons	81
4.4.5.1.4. Discipline	82
4.4.5.1.5. Feedback on assessment	83
4.4.6. Theme 5: Foreseeable successes and failures of Mathematics curriculum change	84
4.4.6.1. Inadequacy of training	85
4.4.6.2. Lack of resources	86
4.4.6.3. Financial constraints	88
4.5. SUMMARY	91
CHAPTER 5: SUMMARY, CONCLUSION AND RECOMMENDATIONS OF THE STUDY	
5.1. INTRODUCTION	92
5.2. OVERVIEW OF THE STUDY	92
5.2.1. Demographic information	94
5.2.2. How the study responded to the research questions	95

5.3. THE MAIN FINDINGS OF THE STUDY	98
5.4. CONCLUSION	99
5.5. LIMITATION OF THE STUDY	99
5.6. RECOMMENDATIONS FOR THE STUDY	100
5.7. RECOMMENDATION FOR FURTHER STUDY	101
5.8. CHAPTER SUMMARY	102
5.9. CONCLUSION	102
6. REFERENCING	103
7. ANNEXTURES	112
Annexure 1: Interview guide	116
Annexure 2: List of schools	118
Annexure 3: Participant informed consent declaration	119
Annexure 4: Application letter to conduct research	121
Annexure 5: Permission letter to conduct research	122
Annexure 6: Ethical Clearance	123
Annexure 7: Editing Certificate	124
 7. LIST OF TABLES	
Table 1.1: Sample size	8
Table 3.1: Number of participants	37
Table 4.1: Teaching experience in years	45
Table 4.2: Academic qualifications	46
Table 4.3: Themes and sub-themes	47

CHAPTER 1

BACKGROUND TO THE STUDY

1.1 INTRODUCTION

Issues of curriculum change had brought challenges to both teachers and learners in developed or under developed countries including the management teams of schools and the Department of Education leadership (Human Sciences Research Council, 2012). Since 1994, South Africa decided to change many things such as to democratise education. The implementation of a new education system was also considered under those political issues. South Africa was amongst those countries that experience curriculum challenges (Carl, 2009 p.17). "Education as a professional field is constantly changing, change in values takes place, new curricula are introduced and new technologies define how we teach and learn".

The introduction of the Curriculum 2005 led to various changes of approaches in the education system in South Africa (Jansen, 2003). These changes involved Mathematical reasoning, problem solving and communication. Revised National Curriculum statement (RNCS) was declared the new official curriculum in 2002. This change caused a problem because the teachers became confused on how to teach Mathematics in the foundation phase and the level of disciplinary and pedagogical understanding that RNCS requires. Its implementation and assessment, being open to a wide variety of interpretations, made teachers to lack clarity about what was required of them (Masondo, 2010).

The panel, mandated in 2009 by the Minister of Basic Education to investigate the curriculum implementation challenges, came up with the following findings. These were: changes made to RNCS were in relation to content, assessment and learner

outcomes, were used as background to the introduction of Curriculum and Assessment Policy Statement (CAPS) and implemented in January 2012.

The Curriculum and Assessment Policy Statement (CAPS) had been introduced and its success depended solely on the way it would be implemented. Badugela (2012) stresses that there were some major problems pertaining to the implementation process of the new Mathematics curricula in South African schools due: the lack of adequate training of teachers so that they could teach in the outcomes-based manner well, and lack of financial resources to train or equip teachers with knowledge of teaching learners efficiently and effectively (Chisholm, 2013). Classes were also always crowded to extent that the implementation of the new curriculum could be highly impossible.

CAPS defines Mathematics as human activity that involves observing, representing and investigating patterns and qualitative relationships in physical and social phenomena and between mathematical objects themselves (DoE, 2011). From my observation I saw that the learner developed many skills of humanity. In all those skills, the learner had to use critical thinking to come to conclusions. In order for that to occur, the involvement of the learner to construct something by after observation was needed. The new curriculum represents a shift from the traditional way of teaching and learning to a more interactive approach. In this new way of teaching teachers seem to be lost and apply teaching in the way that suits them.

Teachers do not know what they must do inside the classrooms to make learners actively involved in the lessons. Learner- driven approach draws upon constructivism, which is a theory of learning that assumes that people learn by relating new information and skills to what they already know and can do (Prevedel, 2003). Learners should practice new information and skills in a supportive environment. All these affects effectiveness of the new curriculum implementation.

The 'cut-and-paste' process (learners have fun while learning, which help them to develop Mathematical skills) influenced learners to resort to cutting pictures they were asked to cut without any understanding of what they meant to them. For example, the majority of learners could only cut and paste but cannot describe what their 'cuttings' meant to them and what they surely benefited from such an event, after cutting the picture of a cow, they could hardly say: a cow has two horns, it has also has four legs, and it has a head with a mouth to eat grass with.

The particular problem that was noted is that of learners were unable to perform basic operations in Mathematics. They lacked the ability to perform computation tasks such as addition, multiplication and division and these affected learners' performance in Mathematics.

Schunk (2004) stressed that the error was a reflection of the learner's inability to carry over from units to tens. The learner might add $17 + 15$ to get 12, but fails to carry 1(ten) over to the tens. In addition, mental Mathematics is used extensively to explore the higher number ranges through skip counting and by doing activities such as "up and down the number ladder" A teacher might give the following chained instruction: Start with pasting 5. Cut a number that makes it 2 more....10 more....6more...and so on. CAPS (2012) states that these activities help learners to construct a mental number line. This example and other obstacles compelled me to conduct a research on the effects of curriculum changes on Mathematics teaching and learning in foundation phase.

1.2. PROBLEM STATEMENT

Since 1994 there were several curriculum reforms in the South African Education system. The introduction of each new curricula brought with it some challenges (Schmidt, 2017). Teachers were not brought on board when new curriculum was introduced and the challenges continuous. Some teachers try to use the 'old' methods

of teaching but had not been allowed to do so by their principals (Jansen, 1998) as these methods were deemed irrelevant. The widespread negative criticism of education curricula in South Africa by the media, the general public and teaching fraternity became a driving force behind this study. Foundation phase stage formed the base where the knowledge of Mathematics learning could be thoroughly taught so that learners might have a good background. It is against this background that the question being asked in this study is: What is the effect of curriculum changes on Mathematics teaching and learning in foundation especially in Sibasa Circuit.

1.3. AIM OF THIS STUDY

In this study, the aim was to investigate the effects of curriculum changes on Mathematics teaching and learning in foundation phase in Sibasa Circuit.

1.4. OBJECTIVES OF THIS STUDY

This study was guided by the following research objectives:

- To explore the effects curriculum changes on Mathematics teaching and learning in the foundation phase.
- To assess the effects of curriculum changes on Mathematics teaching and learning in the foundation phase.

1.5. RESEARCH QUESTIONS

- What are the effects of curricula changes on Mathematics teaching and learning in the foundation phase at Sibasa Circuit?

- How curricula do changes affects Mathematics teaching and learning in the foundation phase?

1.6. RESEARCH DESIGN AND METHODOLOGY

This section presented the research paradigm, research design and methodology employed in this study.

1.6.1. Research paradigm

Nkosi (2014) and Phakisi (2012) indicated that researchers involved in qualitative research from the interpretive paradigm, believed that individuals consciously constructed their own understanding of the world through experience. This study adopted an interpretive paradigm.

1.6.2. Research approach

According to Ntshaba (2012), a research design refers to how research is conducted from the beginning until to the end. Qualitative research was used in this study because it presented me with the opportunity to explore and gain an in-depth understanding of teacher's experiences in the implementation of curriculum changes in foundation phase specifically in the Sibasa Circuit. Furthermore, data was collected through sustained contact with people in setting where subjects mostly spent their time, at their workplaces. It also provided information about the human side of an issue, that is, the often contradictory behaviour, beliefs, opinions, emotions and relationships of individuals in the implementation process. It was my opinion that qualitative research design is the most effective for this study, considering that the topic is a practical issue in an education sector.

1.6.3. Research methodology

Welman, Kruger and Mitchell (2013) also stated that a research methodology is a process that considers and explains the logic behind research methods and techniques. Wagner, Kawulich and Garner (2012) argued that one should attend to methodology in terms of epistemology (philosophical knowledge, knower's, and knowing and eventually a theory) in order to distinguish paradigms. The methodology section in a research should, if properly done, contain the sample, procedure, method of data collection and data analysis components of the proposal. Henning, Van Rensburg and Smit (2010) pointed out that a research methodology is the coherent group of methods that complement one another, and that have the goodness of it, with reference to the delivering of data and findings that reflect the research questions; finally, suit the purpose of the study.

In this study, a qualitative research approach was used because it allows me to approach reality from a constructivist position, which allows for the multiple meaning of an individual's experiences to be considered most. It furthermore gives me enough chance of exploring and understanding a central phenomenon, which is the process explored in a qualitative research approach. Apart from this, qualitative research approach also plays a pivotal position due to the fact that when utilising it, it often displays observations (Bless, Higson-Smith and Kagee, 2010). The qualitative research method appears to be more suitable to this study because its main aim was to engage in a researcher that probes for a deeper understanding of a phenomenon, and to search for the causal relationships. Its importance (qualitative research approach) in relation to the study under way, lies in the fact that it engages itself in research that probes for a deeper understanding, data is recorded by making notes during interviews and observation protocols, and it also transcribes text data for further analysis (Kumar, 2014).

1.6.4. Population

Johnson and Christensen (2012, p.218) define population as “a large group to which a researcher wants to generalise the sample results”, the total group that one is interested in learning more about. Two primary schools at Sibasa circuit were selected purposefully from twenty primary schools. In this study, the population was composed of foundation phase teachers, heads of department and principals.

1.6.5. Sampling procedure

Sampling refers to strategies used to select a sample of participants chosen from the whole population in order to gather information about the larger group (Macmillan & Schumacher, 2013). Purposive sampling procedure was used in this study. The composition of the sample in this study was as follows: Two primary schools were purposively selected in Sibasa Circuit. On the basis that they had been piloted for National Education Collaboration Trust (NECT). Participants were purposively selected in order enable to draw in only information from participants who have reliable information in terms of managing curriculum changes. Heads of department and principals who are responsible for seeing that curriculum is implemented and there is effective teaching and learning in schools. The teachers were selected on the basis that they had been curriculum implementers; therefore, a purposive selection of such participants was on the basis of their active involvement which is determined prior to approaching them as participants. This helped me to collect rich data and useful information.

In this study, the sample was composed of: four (6) teachers, two heads of department and two principals from the two sampled schools in Sibasa Circuit as shown in Table 1.1

Table 1.1: Sample size

Participants	Number
Teachers	6
Heads of department	2
Principals	2
Total	10

1.6.6. Data collection procedure

Data collection procedures are methods and instruments used in conjunction with one another in order to collect data in a simpler manner (Holliday, 2012). On the other hand, Blanche, Durrhein and Painter (2012) indicated that data are the basic materials with which researchers work. To draw valid conclusions from a research study, I analyse the data and interpreted them to capture meaning of what I observed.

In this study, I use face- to- face interview in order to collect data from the sampled participants. Before the interview begin, I disclosed permission received from the Department of Education, the Circuit office and one from principal of the schools for the participants to show that had official approval. Prior to the interview, the participants were asked to sign declaration of consent and indicate if they are willing to be the participants. A voice recorder was used for recording verbal answers from the participants. The interview took thirty to sixty minutes for each participant. The interviews took place after school hours to avoid interference with normal classes. The interviews were conducted in English for all participants.

1.6.7. Data analysis procedure

Boeije (2012) maintained that analysis is the breaking down and dissembling of research materials into pieces, parts, elements of units. During this process, facts are

broken down into manageable pieces, then sorted properly for types, classes, sequences, processes and patterns to assemble data in a meaningful manner. Cohen; Manion and Morrison (2012) acknowledged that data analysis constitutes the final stage of hearing what the participants have said.

In this study, I used thematic content analysis approach. During data analysis, specifically in a qualitative research approach, the steps below are followed when the thematic content analysis method is used (Blanche, Durrhein & Painter, 2012):

Step 1: Familiarisation and immersion

I read through the description of the participants many times. Transcripts were read and re-read to get the meaning from what was being said. Notes were made throughout the reading of the transcribed text in an attempt to become immersed in the data. In this phase, I went through all my data from my entire interview and took notes, and started making preliminary idea for codes to describe my content

Step 2: Inducing themes

I assigned preliminary codes to my data in order to describe content from transcripts Drawing out underlying themes from the interviews and clusters then as the main themes and sub-themes example, I felt that since the beginning of the new curriculum there was too much administrative work. This pertains to preparing learners portfolio and profiling learners; sometimes I set simple, poor quality tasks to make sure that learners pass to avoid to writing intervention strategies.

Theme: Teachers view on curriculum changes.

Sub theme: Administration of teaching and learning activities.

Step 3: Coding

I searched for patterns or themes in my codes across the different interviews. I marked different sections of data as being examples, or relevant to one or more themes. I coded important statements with different colours.

Step 4: Elaboration

Afterwards, I corrected all the mistakes during coding. Immediately thereafter, I explored more themes closely.

Step 5: interpretation and checking

Finally, I put the interpretation together, defined and named the themes by so doing, I fixed weak points from the written account after checking. Example:

S1T3: "I think we should be trained "

S2T2 : "They gave us training for only one day about new content to teach new topic, they should prolong the thing, may be for one to three days training"

Putting them together and becomes: Inadequate training

1.6.8. Ethical and safety issues

Data collection did not interrupt participant's normal teaching; it was done during teacher observation time. In this study I adhered to the following ethical standards of research:

- The participants were informed that the purpose of this study was to assess the effects of curricula changes on the teaching and learning of mathematics in the foundation phase and that the study will benefit the department, teachers and learners.
- The participants were also informed that they should participate voluntarily and that they were free to stop participating at any stage.
- Participants were assured of their anonymity and in this regard researcher further assured participants that their names or identities would not be disclosed. Confidentiality was also be ensured by protecting all data gathered and by not making the data available to outsiders.
- All data were stored in a locked cabinet and the data was destroyed after completion of analysis. Electronic data was stored on a computer requiring password access
- I assured the participants that the participation in this research would not cause them any physical discomfort, humiliation and emotional stress.

1.7. KNOWLEDGE DISSEMINATION

Dornyei (2008) asserts: "What matters most in any dissertation or thesis, is the dissemination of the knowledge gathered during investigation." On the other hand, Creswell (2014) indicates that the issue of 'knowledge dissemination' is a process which actually involves those who would benefit from the study in one way or another.

The section on 'knowledge dissemination' further discusses the importance that the study in question bears towards the beneficiaries such as people or generation about whom the investigation is conducted.

Looking at knowledge dissemination's actual meaning, it clearly shows that the findings of this study will indeed add value to the body of knowledge to all the legitimate or interested stakeholders. These might include personalities, such as, beginner researchers and the leadership of the Department of Basic Educators in Limpopo Province. Furthermore, the parents and the School Governing Body (SGB) may also find new mechanisms of helping learners on how to study Mathematics well through the seeking Mathematics experts in the communities who could assist learners over the weekends. The School Management Team (SMT) also invited motivational speakers or religious leaders to motivate learners into learning in the easier way. The parents although they are not teachers, could benefit after reading findings of this study and also know the tactics they could apply in order to assist their children towards Mathematics learning even at the foundation phase. Nevertheless, the above-mentioned stakeholders might benefit if they could work hand-in-glove with the other concerned stakeholders in an effort of benefiting from the knowledge dissemination's process.

1.8. PRELIMINARY CHAPTER DIVISION

Chapter 1: This chapter contains the background information, purpose of the study, research questions, aims, including an overview of research methodology.

Chapter 2: This chapter examine the literature surrounding the issue of the effect of curriculum changes on Mathematics teaching and learning in the foundation phase. This chapter also provides detailed information on the theoretical framework underpinning this study.

Chapter 3: This chapter provides details of the methodology used in investigating the effects of curriculum changes on Mathematics teaching and learning in the foundation phase in Sibasa Circuit. The data collection strategies used in the investigation are also included.

Chapter 4: This chapter provides findings in a clear, cohesive and comprehensive manner along with the discussions that relate to the findings. I identified patterns and themes in the response from teachers, heads of department and principals.

Chapter 5: This is the conclusion chapter that entails the summary of the research, the conclusions from its findings and recommendations arising from the findings.

1.9. SUMMARY

In this chapter, I gave an overview of the research by summarising the problem. The statement of the problem and the aims of the study were presented, as well as a summary of relevant concepts. The method of research and demarcation of the research area were also mentioned. The next chapter reviews literature on the effects of curriculum changes on Mathematics teaching and learning.

CHAPTER 2

LITERATURE REVIEW

2.1. INTRODUCTION

The previous chapter introduced the major issue of the study which included the statement of the problem, the purpose, study objectives, research questions, the research design, data collection procedure, sampling and ethical safety issues. This chapter provides a review of literature on the effect of changes in curriculum. This includes the theoretical framework and the historical background of curriculum changes in South Africa and the effects of curriculum changes in the teaching and learning of Mathematics in the foundation phase. The review of literature also include the effects of curriculum changes in South Africa before 1994 until the recently introduced Curriculum and Assessment Policy Statement (CAPS).

The review of literature was guided by the following research objectives:

- To explore the effects of curricula changes on Mathematics teaching and learning in the foundation phase in Sibasa circuit.
- To assess the effects of curriculum changes on Mathematics teaching and learning in foundation phase in schools found in Sibasa Circuit.

2.2. THEORETICAL FRAMEWORK

The theoretical framework refers to asset of concepts or understanding of the world in the field of research or empirical work. Kumar (2014) stated that a theoretical framework is the basis of one's research problem.

Von Glaserfields (1993) radical constructivism theory was chosen because it supports the view that learners build their Mathematical concepts of what they learnt through active cognitive and adaptive process. This process explains the steps that learners should undergo through assimilation, accommodation, adaptation and reconstruction (Belbase, 2016).

Von Glasersfield's radical constructivism theory related to how Mathematics should be learnt by learners. It also involves aspects such as learning Mathematics through active construction of the meaning of concepts for learners, peers, elders and teachers. The theory recommended that during Mathematics teaching and learning in whatever phase, assimilation plays a pivotal role. If a teacher is teaching the addition a learner should compare it with what he already knows from his environment.

Von Glasersfield's radical constructivism theory further displays another type of close relationship with the topic by urging Mathematics teachers at foundation phase to empower themselves with the understandings of the philosophies of science and Mathematical knowledge. According to Winner (1993) Von Glaserfields radical constructivism theory if properly applied, assist Mathematics teachers in getting rid of the insufficient cognition form of radical constructivism in their fights against the current cultural traditions in which mathematics is still being taught in some institutions over the world . Moreover, such practice might help to endorse relativist epistemologies without which, no progress in their pedagogical practices could be achieved.

In addition, Von Glasersfield's radical constructivism theory is regarded as the primary exponent of radical constructivism, a theory of knowing that is resonating worldwide with reformist desires of science and Mathematics teachers (Knipe, Van der Walt, Nicker, Burger & Nel, 2013). Schools which are regularly performing well in Mathematics, are indeed making use of the radical constructivism theory's recommendations (Swanson, 2013). Classrooms in which learners can communicate their point of views on how to solve mathematical problems can provide them with rich opportunities to explore, test, experience, negotiate, and argue to defend their

positions. From a constructivist perspective learning Mathematics entails learners actively create, interpret and reorganise knowledge in individual ways (Gordon,2009)

Teachers from those highly performing schools especially in foundation phase Mathematics, are regularly trying to develop a deep understanding of the ever evolving patterns of the thought that underpin Von Glasersfield's theory so that their schools should keep on doing well in Mathematics(Gordon,2009) . All the constructivist's embrace the basic principle of the active role of learning. Learning is transferred onto the learner's cognitive structures through the social interaction between the learner and the teacher (Jacobos, Vakalisa & Gawe, 2014).

The learners' prior knowledge and learning environment are important for this process of learning the learners use their senses to observe and experiment and then they actively create, interpret and reorganise knowledge in individual ways (Gordon, 2009). CAPS encourage the active nature of learning which is aligned with the active mental experiences which results in strong acts of construction if learners are to achieve the desired Mathematical understanding (Paulson, 2009).

Few teachers encourage learners to perceive what they are doing as the construction of knowledge(Paulson,2009).Mathematics learners think that to be successful in class they do not need to create and operate on meaningful mental constructs, they merely need to learn to follow the teachers instructions(Cobb, Wood, Yackel and McNeal,2013).Learners in the process of active role they use prior knowledge and resources in their environment to construct mathematical knowledge(Paulson,2009).Von Glaserfields (1993) called this the first principle of constructivism.

Teachers use this theory to train their learners to be able to form their own methods of solving Mathematical problems. Although many attempts have so far been made in relation to testing the validity of the radical constructivism theory still attains a good

position in both science and mathematics teaching in foundation phase (Hardy, Taylor, Dawson and Milen, 2015). In conclusion, Schools which are regularly performing well in Mathematics, are indeed making use of the radical constructivism theory's recommendations. There is clear evidence that implementation of the curriculum has so many things revolving around in it that this has an impact on the performance of learners which needs to be considered (Paulson, 2009). There are growing levels of learner underperformance in mathematics (Olivier, 2015).

2.3. FACTORS AFFECTING CURRICULUM CHANGES OF MATHEMATICS TEACHING AND LEARNING

There are several factors affecting curriculum change of Mathematics teaching and learning which include approaches to teaching and learning Mathematics, perceptions of teacher's belief towards curriculum change, learner teacher support materials, impact of curriculum change on teacher development, monitoring and support on curriculum changes and parental involvement in Mathematics teaching and learning. These are discussed in the sections that follow:

2.3.1. Approaches to teaching and learning

Change rises emotions and despair in both teachers and learners, but it can also raise hope, growth and progress if well maintained (Machaba, 2016). Jacobos, Gawe and Vakalisa (2014) pointed out that despite good training in preparation of teachers to handle changes, teachers always display signs of confusion and fear to apply them in classes.

The use of question and answer method in Mathematics teaching used today, helps to train learners with the skills of answering questions correctly (Van de Walle & Jansen, 2016)

2.3.2. Teacher's belief towards curriculum changes

Teachers are afraid of any change that might occur in the educational system especially the changes that occur without their consultation. Many changes to curricula happened without their consultation, and their unions complained (Peters, 2010). In addition to this, teachers also feared for the unknown, of which they lacked knowledge and understanding. The way teachers perceive curriculum changes may have either a negatively or positively effects on teaching and learning Mathematics in foundation phase. This leads teachers to an extent that they even become confused and further lack understanding of how to teach Mathematics after curriculum changes had emerged (Tshiredo, 2013).

Principals live in fear due to lack of knowledge and skills of assisting their teachers, principals would have failed in influencing teachers towards the implementation of such a curriculum. The experience of other countries is of vital importance with regard to the implementation of any curriculum in the educational system (Piaget, 2017).

Change is also a phenomenon that carries all aspects of person's life. It helps to bring about alterations in both the personal and employments spheres. According to Bertels (2013), change can be described as a process of analysing the past to elicit the present state, via the transactional state, to a desired future. The future of any change further involves mechanisms or ways of introducing an annotation that produces something better, hence the implementation of the new curriculum. Moreover, the implementation of a new curriculum, a strict management process is needed. Principals as key figures, around which much of the schools activities revolve, and to a great extent determines the schools success or failure when changes are wrongly implemented (Van der Horst & McDonald, 2014).

Teacher's beliefs systems reflect the personal theories about the nature of knowledge that, in turn, influence teachers curriculum decision making approaches (Handal &

Herrington, 2013). In accordance with Thompson (2014), teacher's beliefs seemed to be the manifestations of an unconsciously held view of expressions of verbal commitments to abstract ideas that may be thought of as part of a general ideology of teaching. The school attendance aspect together with knowledge of the curriculums most important characteristics, usually act as cognitive and effective filters through new knowledge and experience could be interpreted and enacted (Artz & Thomas, 2016).

Literatures show that teachers' beliefs affect their classroom practice although the nature of the relationship is highly complex and dialectical (Pajeres, 2012). On the other hand, one teacher who also gives lessons in Mathematics believes that oral work might play a major role in motivating learners. Teachers' beliefs influence instructional behaviours of teachers, while in the other instances, it appears that instructional practices influence teachers' beliefs (Buzeika & McGillard, 2016).

2. 3.3. Effects of curriculum changes towards teacher development

A key factor on which the success of curriculum innovations depends is the servicing of teachers in the use of new approaches (Mata, 2012). In order for new change to be successfully implemented, teachers need to receive orientation and training. Ball (2013) states that although encouraging teachers to increase their knowledge of Mathematics is necessary, it is not sufficient. Furthermore, Mathematics teaching depends, among other things, on the improvement of our understanding of its mathematical nature and demands and the provision of opportunities for professionals to acquire the appropriate Mathematical knowledge and skills as well (Ball, 2013). Linnemanstons and Jordan (2017) state that teachers should be supported and assisted by well-structured professional development for effective curriculum implementation. Furthermore, the study of Linnemanstons and Jordan (2017) indicates that teachers without Mathematical background struggle in Mathematics curriculum to instil Mathematical knowledge to their learners.

In order for teachers to develop their own materials, they need training (Badugela, 2012). The implementation of C2005 was a challenge for many South African teachers who had inadequate knowledge, skills and competences; this case is more serious with Mathematics due to inadequate training. There are few teachers who qualified in Mathematics and Science, which lead to poor quality teaching and learning of Mathematics (Jansen Christie, 1999).

Inadequate training of teachers makes it complicated for teachers to learn what is expected from them (Mamosa, 2010). Teachers need to be supported to help them to adopt and accommodate new ideas into their teaching and learning (Kirkgoz, 2008). Continuous training equips teachers with the necessary skills needed in curriculum implementation. Teachers are confused with regards to their attendance of in-service training and workshops which leave them unskilled (Marsh & Willis, 2015). It is very important for teachers to be provided with skills and sound knowledge prior to the implementation of the new curriculum in order to deal with factors that affect implementation of curriculum changes (Flores, 2016).

2.3.4. Effects of financial constraints towards curriculum implementation

Badugela asserted that schools need financial support from the government, parents and NGO in order to implement the new curriculum effectively. Funds are needed in order to purchase learning and teaching materials. In terms of the South African schools Act of 1996, the state finances public schools from public revenue on an equitable basis in order to ensure proper exercising of the rights of learners to education and redressing past inequalities in education (Mdtshane, 2006). Schools falling under Section 21 receive norms and standards from the government. These norms and standards address (a) the public funding of public schools, in terms of Section 35 of the Act (b) the exemption of parents who are unable to pay school fees in terms of section 39(4) of the Act (1), (c) Public subsidies to independent schools in terms of section 48(1) of the Act. The amount the schools receives is not enough to

address the shortages of learner teacher support materials (LTSM), and this lead to poor implementation of curriculum change.

2.3.5. Learner-teacher support materials

Adequate support materials are essential to the effective implementation of education, and in particular, textbooks in their teachings. Local and international research has shown that the textbook is the most effective tool to ensure consistency, curriculum coverage, appropriate pacing and better quality instruction in implementing curriculum (Moodley, 2013). Tshredo, 2013) indicated that change requires commitment to developing necessary capacity to support changes. Jansen (2001) emphasised that curriculum development, as long as a long term development, needs rearrangement of content, including textbooks revision. In addition, lack of resources is one factors that affects curriculum implementation (Jansen & Tailor, 2003).

Badugela (2012, p.36) added, “The availability of resources, funds, training, teachers and a positive school climate are important for success of curriculum implementation”. Material resources appear to be lacking or underutilised in many South African Mathematics classrooms, and this affects implementation of Mathematics curriculum implementation (Jacobos & Brandt, 2012).

2.3.6. Monitoring and evaluation

A role that mathematics teacher should play in terms of providing quality teaching of Mathematics, is rated higher in the educational development of every learner (Nieuwenhuis, 2014). The leadership role of the principal is crucial in the implementation of curriculum change (Jenkins & Pfeifer, 2012

Curriculum irrespective of how it has been formulated or designed, cannot be well implemented unless it has been through the supervisory function of all the concerned educational stakeholders (Barrows, 2015). Additionally, the (Department of Basic Education, Circular No.6 of 2016) acknowledges that the school management should from time to time monitor and guide teachers towards curriculum implementation.

In a school situation where school management team does not see eye to eye with the other concerned stakeholders, poor results are usually the order of the day (Evans, 2013). Suggestions on monitoring and strict guidance would help in the promotion of teaching and learning. Marishane (2016) also holds the view that once workshops, seminars and conferences in this regard are held under the guidance of the experts in educational matters, the implementation could bear fruitful results. Apart from this, the continued visits to schools by subject advisors might also be of help if well applied.

There was lack of leadership to focus on improving the implementation of the NCS by both teachers and the DoE in Limpopo (Netshikhophani, 2011) which led to poor implementation of curriculum change.

2.3.7. Parental involvement in mathematics teaching and learning

Miller-Jones (2015) stressed the fact that although parent's role in their children's learning is essential, one important aspect remains constant; and it is that parents are their children's role models. Their attitudes towards education can inspire them to obviously take charge of their own educational journey. In addition, Sybil (2018) notes that a parent needs to be positive role model for his own child so that he could shape opinions and attitude towards learning.

Learners need the support of parents especially on their way towards mastering Mathematics in the foundation phase schools. They need guidance from their parents on their school work. Moloi (2017) suggested that it is also the parents' duty to remind

their child while at home, about the pending school activities on every day basis. By so doing the child would develop a habit of doing the school work on his own will. This would therefore assist in the learner's achievement of all the learning areas done in schools. Colorado (2015) also supported this view, by stating that family does towards a learners' education counts more than how much money or how much the education parents have. Consequently, a slight absence from school by a learner especially in a Mathematics class, could result in him having missed some vital concepts. In accordance with the Department of Basic Education, Circular No.4 of 2015, teachers rarely agree to repeat items they taught because this might delay them in completing their syllabuses (year plan programs) on time.

Apart from the support that parents could offer to their foundation phase learners, absenting oneself from school today is an invitation of more trouble. The reason is that the class marks, including CASS marks and test marks, count a lot in the promotion of the learners to the next grades these days. This therefore leads us to a realisation that a learner who might absent himself on the day on which a test is written, has a small chance of proceeding to the next grade. Parent play a paramount role in route to assisting their children towards performing well in Mathematics (Hoadley and Jansen, 2010).

2.3.8. Teacher-learner ratio and over crowdedness

According to Human Sciences Research Council (2015) smaller classes might if well used, go to an extent of influencing learners to understand Mathematics well. Teachers cannot give attention to individual learners in large classroom (Angular, 2015). Learners in small classes were more active than in large classes (Cobb, Yackel and McClain, 2013). Cooney (2015) also noted the point that class size issue in respect of how teachers work, could play a paramount role helping learners to learn Mathematics easier.

It is noted that larger classes bear constraints comprising of: lack of physical space for movement around the classes, retards the learner's opportunities of concentrating fully in lessons being done, the impersonalising of teaching, excessive workload for teachers and also the limited chances of confronting learners individually (Donlan 2015). The meeting of learners on an individual basis is of vital importance on Mathematics teaching hence it entails aspects such as self-activity, inquiry, motivation, discipline, safety and socialisation. This led to the implementation of mathematics curriculum the easy way.

Mallows and McNeill (2016) also revealed the fact that smaller classes have benefits on the slow learners because they could be addressed individually well. The effects of the small class sizes seem to be more effective in the foundation phase level because they make teaching of Mathematics effective or efficient. Larger classroom results in less individual attention (Sidiropoulous (2008)

2.3.9. The language issue in mathematics teaching and learning

According to Naude, Pretorius and Vandeyar (2012), the majority of grade one learners enrolled in South African Schools have various academic learning difficulties due to limited language proficiency. The other reason is that they did not attend crèche before coming to foundation phase. The language of instruction of the school should be aligned to the needs of its learners, and schools should make every effort to provide instruction in the language of preference of their learners because it leads to curriculum effective implementation (Naude, 2012).

Learners who have come to schools after knowing the language of instruction displayed the spirit of being committed to what they have learnt when asked in classes. Thus teachers have always to be patient when giving lessons on concepts that involve, the minus, plus, divide and multiply, because they usually demand the use of language proficiency (DoE, 2015). The tendency of Mathematics teachers and policy makers to

keep emphasising a distinction between the subject language of Mathematics and more informal talk, could also be acting as an obstacles towards Mathematics curriculum implementation(Mercer,2016).In addition, Mecer (2016) pointed out that group activities often offer valuable opportunities for learners to construct solutions for themselves through talking, which may not be found in the whole class teaching. Group work, enables learners who know some aspects well to express themselves freely. It leads learners where they could then regard Mathematics not as a school related phenomenon, but as a concept to be used in whatever environment they are in.In support of this view, Vygotsky (1978) stated that language always plays a paramount role in terms of being a psychological and cultural tool in Mathematics teaching.

2.3.10. The knowledge base for teaching and learning of mathematics

Mathematics teaching differs from the other subjects taught, because it actually embraces the three kinds of knowledge, namely: knowledge of Mathematics, knowledge of learners and knowledge of instructional practices (Ma, 2013). Mathematical knowledge also include the knowledge of Mathematical facts, concepts, procedures and relationships amongst them, knowledge of ways that Mathematical ideas can be represented.

Knowledge of Mathematician reality, must include the consideration of goals in Mathematics instruction, and also provides a basis of discrimination and prioritizing those goals. Knowing Mathematics with the aim of teaching it, should entail more than knowing Mathematics itself (Little, 2016). Consequently, the understanding of the conceptual foundations of knowledge plays a prominent part in primary mathematics learning (Shulman, 2016). Mathematics teachers should always bear in mind that Mathematics sensibilities they hold matter in guiding their decisions and interpretations of learners' Mathematical efforts count more in the procedure of learning Mathematics.

2.4. THE EFFECTS OF CHANGES IN MATHEMATICS CURRICULUM IN THE FOUNDATION PHASE

This section presents the effects of curriculum changes from Outcomes based to Continuous Assessment Policy Statement.

2.4.1. Effects of Curriculum 2005

Curriculum 2005 (C2005) was introduced in 1998 and fully implemented by the year 2005 based on the notion of Outcomes based Education (DoE, 2000). The aim of Education in introducing curriculum 2005 was to step away from racist, apartheid curriculum dominated by rote learning to a curriculum that focussed on liberation, nation building and learner centred outcomes based system (Jacobs, Vakalisa and Gawe, 2014).

C2005 employed methodologies used in the progressive pedagogy such as learner centeredness, teacher as facilitators, relevance, contextualised knowledge and cooperative learning (Chisholm Report, 2000). OBE promoted curriculum and assessment based on constructivist approach and discouraged traditional education approaches based on direct instruction of facts and standard method (Lekgoathi, 2010).

The introduction of C2005 in South African schools brought complex curriculum changes with inadequate preparations and support to teachers who are expected to play a role in its implementation (Flores, 2016). In addition, Jansen (2012) in his critique, stated that OBE was not carefully planned, especially with regard to how the curriculum would be implemented in under resourced classrooms.

De Waal (2012) indicated that it is very important for the teachers to be provided with appropriate skills and sound knowledge prior to implementation of the new curriculum. In addition, C2005 was designed to produce citizens with high skills, knowledge, attitudes and values needed to rebuild South African (Van der Horst & Mc Donald, 2014). The curriculum demanded that teachers be remodelled as professionals who continually make decisions in developing learning materials, which best suits their learners in the classroom situation (Hoadley, 2012). Teachers need to change their classroom strategies and practices for OBE to be successful (John, 2014).

Jansen (1998), asserted that OBE undermined the already fragile learning environment in schools and classrooms of the new South Africa: instead of promoting innovation, OBE could fail for the following reasons:

- The effects of OBE on society and the economy are unfounded, misleading and misinforming teachers and the public; and
- Language and concepts associated with new curriculum is too complex, confusing and often contradictory.

The Minister of Education, Kader Asmal convened a committee to review c2005 to see whether it is developing citizens that the country envisaged. The Review Committee consulted teachers, departmental officials and other stakeholders and found that C2005 had several weaknesses such as:

Language

The policy was too difficult to understand, teachers struggled to implement it in the classroom situation which led to ineffective implementation of Mathematics curriculum. Teachers have difficulty in understanding new language usage, so this made teachers to be demotivated

Overcrowding

C2005 had many designed features, such as: learning area, learning programmes, critical outcomes, assessment criteria, range statement, performance indicators, phase and programme organisers, and finally the expected level of performances. (Steyn, 2011).

Progression and integration

Teachers were encouraged to combine knowledge from different areas, which is integration, but did not give guidance on what to teach, when to teach it and what level to implement it.

2.4 .2. Effects of the Revised National Curriculum Statement

The RNCS was fully implemented by the year 2002. The study of Chisholm (2005) asserted that the introduction of RNCS was an attempt to simplify C2005, with the intention to make OBE much easier to implement. The RNCS aimed at stimulating the minds of young people so that they are able to participate fully in economic and social life (DoE, 2002a). It is intended to ensure that all learners are able to develop and achieve to their maximum ability and are equipped for lifelong learning (DoE, 2002).

Teachers experience problems on the amount of training they received, the quality of curriculum advisors, proliferation of policy documents from national, provincial and even district trying to make it more understandable and lack of learning and support materials (Selesho & Monyane, 2012).

Similar findings were presented by Magashoa (2014) on condition faced by teachers in implementing NCS in Mpuluzi circuit of Mpumalanga Province. This study indicated that inadequate skills among teachers led to difficulties in developing learning activities designed to assist learners in understanding their learning area. In addition, it overemphasised assessment and administration, which overloads teachers with tasks which are not related to their teaching (Hofmeyer, 2010). The use of various forms of assessment led to an administrative burden to teachers (Chisholm, 2005).

NCS did not provide enough guidelines in the classroom for teachers on how to improve teaching, learning and assessment activities; there was no clarity on passing or failing of learners. Assessment tools were very general, and there were many assessment. There was too much emphasis on assessment, thus leaving insufficient time for actual teaching and learning (Review Committee, 2009). In addition, officials blamed teachers for failure to develop tools to help to interpret policies and guidelines and contributed to confusion and proliferation of documents and paperwork (Review Committee, 2009).

The NCS has to address the jargon used in the documents, reduce the excessive workload and reinstate development of proper basic Mathematics and science skills, which were apparently neglected in C2005 (Geyser, 2000). The assessment standards in the NCS give clear indication of what is to be achieved than the range statements or performance indicators C2005. The assessment standards also show progression across grades, something that was completely absent from C2005 (Hoadley, 2012).

2.4.3. The effects of the Curriculum and Assessment Policy Statement

According to Minister of Education Angie Motshekga, CAPS is not a new curriculum but an amendment of RNCS. Du Plessis (2012) argues that the curriculum is written in its content format rather than outcomes based format, which led to more traditional teaching than OBE methods. It was implemented across primary level grades in

2012. The aim of CAPS is to improve the knowledge and learner performance levels in numeracy and literacy (DBE, 2012). Van der Berg and Louw (2007) state that CAPS recommends that evaluation of learners' work to be both formal and informal assessment, which must be recorded, related and reported to different stakeholders.

Moodley (2013) asserted that, CAPS strengthens the NCS to improve the quality of Mathematics teaching and learning. All outcomes and assessment are illuminated. The CAPS uses only one document and not the many documents that were needed by C2005 and NCS. CAPS leaves no option to choose what to teach, thus teachers have to follow exactly what is in the policy document.

Implications for implementing CAPS:

- CAPS prescribe what should be taught and when.
- Teachers from previously disadvantaged schools will always struggle to keep up with the pace, given that no provision is made for different levels of education. This could lead to a destructure of curriculum implementation by South African teachers (Moodley, 2013).

2.5. UNDERSTANDING THE NATURE OF CHANGES IN MATHEMATICS CURRICULUM

Introduction of curricula in whichever countries, might have a negative effect on both teachers and learners (Chisholm, 2012). To intensify the educational matter, the NCS emphasized the seven role for the teacher as set out by Norms and Standard for Educators (DoE, 2012) which they should adopt. These includes, amongst others, aspects like: learning mediator, interpreter and designer of learning programs and materials, administrator and manager, scholar, researcher, and lifelong learner, plays community, citizenship and pastoral role, assessor and learning phase specialist.

However, the theme of these different aspects aimed at being mastered by teachers before attempting any teaching of Mathematics in schools.

United Kingdom seems to be good in implementing the Mathematics curriculum, although there are factors that need attention (Sharp, 2009). This inhibiting factor is similar to the one in South Africa when it comes to the implementation of Mathematics curriculum changes. It seems as if different countries have common problems in implementation of curriculum changes, it only differs on how creative teachers are during the implementation state. England had similar experiences regarding provision of monitoring and support of curriculum changes (Sharp, 2009).

During the implementation of CAPS in South Africa the learners found bar model drawing challenging, this problem also associated with implementation in SMC (Singapore Curriculum Mathematics). This led to ineffective implementing of CAPS in South African Schools. However, the Irish National Teachers organisation (INTO) in its report (1990) on Mathematics in the primary school, also highlighted a number of areas where changes were required especially in the primary Mathematics curriculum. Education Committees recommended that actions, particularly in relation to problem solving, overloading of content, estimation, mental and oral maths and the use of Mathematical games have been incorporated into the revised mathematical program in the foundation phase school curriculum (Liecha, 2012). This led to effective tools for teaching because they use actions rather than explanation and also create personal motivation and satisfaction

According to the Department of Education and Science (1996), it is recommended that mathematics is recognised as one of the sciences that should be used in everyday life. The main reason for such a difference is that in Ireland after the introduction of primary school curriculum in 1999, an in-service training programmes was provided by the primary curriculum support program (PCSP). In comparison to a South African situation, such programs were implemented late after complaints from teachers and their unions had been made to the Department of Education (DoE, 2000).

2.6. SUMMARY

This chapter presented the theoretical framework underpinning this study. The theoretical framework helped to ensure a smooth change in curriculum reform. The chapter also reviewed literature under the headings: approaches to teaching and learning, perceptions of teacher belief towards curriculum change, effects of curriculum change towards teacher development, learner teacher support materials, financial constraints, monitoring and evaluation in the implementation of curriculum change, parental involvement in Mathematics teaching and learning and knowledge base for teaching and learning and exploration of curriculum changes on Mathematics teaching and learning in the foundation phase. The next chapter presents the methodology of this study.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

The purpose of this study was to explore or examine the effects of curriculum changes on

Mathematics teaching and learning in foundation phase, in Sibasa Circuit. Chapter 2 presented literature reviewed on the effects of curriculum changes on Mathematics teaching and learning in foundation phase. This chapter focused on the research design and methodology of this study. The research paradigm, population, sampling procedures, data collection procedure, data analysis and ethical issues are discussed and the choice of each methodology justified.

3.2 AIM OF THE STUDY

The aim of this study was to investigate the effects of curriculum changes on Mathematics teaching and learning in the foundation phase in Sibasa Circuit.

3.3 OBJECTIVES OF THE STUDY

This study was guided by the following research objectives:

- To explore the effects of curricula changes on Mathematics teaching and learning in the foundation phase in Sibasa circuit.

- To assess the impact of curricula changes on Mathematics teaching and learning in the foundation phase.

3.4. RESEARCH QUESTIONS

- What are the effects of curriculum changes on Mathematics teaching and learning in the foundation phase in Sibasa Circuit?
- How curricula do changes impact on Mathematics teaching and learning in the foundation phase?

3.5. RESEARCH DESIGN AND METHODOLOGY

This section presents the research paradigm, research design and methodology employed in this study.

3.6. RESEARCH PARADIGM

Nkosi (2014) indicated that researchers involved in qualitative research, believed that individuals consciously construct their own understanding of the world through experiences. Furthermore, Phakisi (2012) noted that researchers involved in qualitative research from the interpretive paradigm believed that individuals consciously constructed their own understanding of the world through experiences. Thus, interpretivist strive to understand people's actions the way they are and try to give meaning by interpreting them. This study adopted an interpretive paradigm as it acknowledged the experiences of participants from the two primary schools.

3.7. RESEARCH APPROACH

According to Ntshaba (2012) a research design referred to how research is conducted from the beginning to the end. Qualitative research design was used in this study because it presented beginning to the end. Qualitative research design was used in this study because it presented the researcher with the opportunity to explore and gain in-depth understanding of the effects of Mathematics curriculum changes in the foundation phase in the Sibasa Circuit.

Furthermore, data was collected through sustained contact with people in settings where subjects mostly spend their time, at their workplaces. It also provided information about the human side of an issue, that is, the often contradictory behaviour, beliefs, opinions, emotions and relationships of individuals in the implementation process. It was my opinion that qualitative research design was the most effective for this study, considering that the topic is a practical issue in an education sector.

3.8. RESEARCH METHODOLOGY

Welman, Kruger and Mitchell (2013) stated that a research methodology is a process that considers and explains the logic behind research methods and techniques. In the other regards, Wagner, Kawulich and Garner (2012) argued that one should attend to methodology in terms of epistemology (philosophical knowledge, knower's, and knowing and eventually a theory) in order to distinguish paradigms. The methodology section in a research should if properly done contain the sample, procedure, method of data collection and data analysis components of the proposal. Henning, Van Rensburg and Smit (2010) pointed out that a research methodology is the coherent group of methods that compliment to one another, and that have the goodness of it, with reference to the delivering of data and findings that reflect the research questions; finally, suit the purpose of the study.

In this study, a qualitative approach was used because it allows the researcher to approach the reality from a constructivist position, it is also permitted multiple meanings of individual experiences to be considered. It furthermore gave me enough chance of exploring and understanding a central phenomenon, which is the concept or process explored in a qualitative research approach (Bless, Higson-Smith & Kagee, 2010).

Apart from this, qualitative research approach also played a pivotal position in this study due to the fact that when utilising it, it is often observation. The qualitative research method appears to be more suitable to this study because its main aim is to engage in a research that probes for a deeper understanding of a phenomenon, and to search for the causal relationships. Its further importance (qualitative research approach) in relation to the study under way, lay in the fact that it engages itself in research that probes for deeper understanding. Data was recorded by making notes during interviews and observation protocols, and I also transcribed text data for further analysis (Kumar, 2014).

3.9. POPULATION

A population of the study was the group of people and events that I am interested in gaining information and drawing conclusions (Bless & Higson-Smith, 2010). Two primary schools at the Sibasa circuit was selected purposefully from twenty primary schools. The population of this study consisted of foundation phase teachers, heads of department and principals from Sibasa Circuit.

3.10. SAMPLING PROCEDURE

Sampling refers to strategies used to select a sample of participants chosen from the whole population to gain information about the larger group (Macmillan & Schumacher, 2013). Purposive sampling procedure was used in this study. The

composition of the sample in this study was as follows: Two primary schools purposively selected in Sibasa Circuit on the basis that they had been piloted for National Education Collaboration Trust (NECT). Participants were purposively selected to enable me to draw only information- rich participants who have reliable information and experience on the management of curriculum change.

The purpose of interviewing teachers, heads of department and principals are responsible for ensuring that curriculum is implemented with effective teaching and learning in schools. The teachers were selected on the basis that they had been curriculum implementers, therefore, a purposive selection of such participants was on the basis of their active involvement determined prior to approaching them as participants. This helped me to collect rich and useful information. The interviews were based on the effects that might be affecting teaching and learning of Mathematics in the foundation phase in the Sibasa Circuit.

In this study, the sample was composed of, six (6) teachers, two heads of department (2) and two (2) principals from the two sampled schools in Sibasa Circuit as shown in the table below.

Table 3.1: Number of participants

Participants	Number
Teachers	6
Heads of department	2
Principals	2
Total	10

3.11. DATA COLLECTION PROCEDURE

According to Holliday (2012) data collection procedures are methods and instruments used in conjunction with one another in order to collect data in a simpler manner. To draw valid conclusions from a research study, it is essential that the researcher has a sound data to analyse and interpret (Monette, Sullivan, De Jong & Hilton, 2014). The purpose of this study was to collect rich and detailed interpretive data. I decided to use face to face interviews to get information from the Mathematics teachers, heads of department and school principals who deal with curriculum. This is in line with Terre Blanche, Durrhein and Painter (2012) observation that conducting an interview is a more natural form of interacting with people and fits well with the interpretive approach to research. It gave me an opportunity to get to know people quite intimately, so that I could understand how they think and feel.

Semi structured interviews were used as an appropriate instrument to answer the research questions. These consisted mainly of open-ended questions that reveal themes. Interview transcripts, field notes and documents are primarily forms of information in qualitative data (Lock, Spirduso & Silverman, 1993). Qualitative research methodology relies on personal contact, and interpretive researchers place a strong emphasis on better understanding of the world through first-hand experience, truthful reporting and quotations of actual conversation from insider's perspective (Antwi & Hamza, 2015).

Based on the point above, I chose to use qualitative research approach in collecting data and use face- to- face interview because there were beneficial to this research paradigm. This is because of their dynamic dictation in the direction that the interview should go and when I wished to gain more information on a given theme. These also allowed moving to another theme when a theme appeared to be saturated. Ensuring accurate and honest answers is also exceptionally good (Gay, 1992). This allows me possible follow up questions, probes and encouraged the participants to say more on theses follow-ups.

Prior to the interview I asked the participants to complete the declaration of consent and they indicate that they are willing to be recorded. This is in line with Mack, Woodsong, MacQueeen, Guest and Namey (2005) who defined informed consent form as a mechanism for ensuring people to understand the meaning to take part in research study in a voluntary manner. In an effort of trying to obtain the valid and reliable findings after data collection, a tape recorder and diary notes were used as supplementary tools with the aim of recording the verbal answers from the participants. Immediately after each interview conducted, I transcribed it as it was to ensure the validity and reliability of the findings developed during the data analysis process.

The interviews took twenty-five to thirty minutes for each participants. They took place after school hours to avoid interference with normal classes. The interviews were recorded in English for all participants. Both principals and heads of department were available for interview questions and were more willing to participate. They seemed not well informed about curriculum changes but mentioned not receiving sufficient training to monitor curriculum in their schools. One teacher kept on postponing the interview until I succeed on the third time; five of them were available for the interviews and were willing to participate. All of them were trained to teach in the new curriculum although they mentioned the issue of insufficient time during training.

3.12. DATA ANALYSIS PROCEDURE

Boeije (2012) maintained that analysis is the breaking down, separating or dissembling of research materials into pieces, parts, elements of units. During this process, facts are broken down into manageable pieces, then the researcher sorts or sifts them properly, searching for types, classes, sequences, processes, patterns or wholes. The aim of this process is to assemble or to reconstruct data in a meaningful manner.

Thematic analysis is the process of identifying themes within qualitative data (Braun and Clarke, 2013). In this study, I analysed data guided by thematic content analysis

approach. The voice recorded words were transcribed into texts. Topics related to each other were grouped in order to reduce mistakes. Data was read for several times before formally coding them. This is in line with Seale (2012) who acknowledged that during coding, data seemed to be disconnected. During data analysis, specifically in a qualitative research approach, the steps below are to be followed when the thematic content analysis method is used (Terre Blanche, Durrhein & Painter (2012). The following steps were used during thematic analysis:

Step 1: Familiarisation and immersion

I read through the description of the participants many times. Transcripts were read and re-read to get the meaning from what was being said. Notes were made throughout the reading of the transcribed text in an attempt to become immersed in the data.

Step 2: Inducing themes

I drew out underlying themes from interviews and clusters as the main themes and sub-themes.

Step 3: Coding

I marked different sections of data as being examples, or relevant to one or more themes. Then coded important statements with different colours (e.g. the effects of curriculum changes in mathematics teaching)

Step 4: Elaboration

Afterwards, I corrected all the mistakes made during coding. Immediately thereafter, I explored or examined more themes closely.

Step 5: Interpretation and checking

Finally, I put the interpretation together, defined and named the themes. By so doing, I fixed weak points from the written account after checking.

3.13. ETHICAL SAFETY ISSUES

Ethics refers to the scientific study of concepts such as bad or good, right or wrong as well as ways that explains their application in context. Research rests on the trust received from participants and, in turn, have to return the gesture through observing principles of good practice (Burton and Bartlett, 2011). Behaviour that causes harm or injury to participants was avoided.

During this study I remained professional in everything I did. I assured my participants that they were free to be part of the interview. I explained that if they felt liked not continuing the process they were at liberty to do so. I explain to them that I would use a voice recorder for purpose of accurate recordings. I issued them consent forms for them to read and sign as an indication that they were voluntary participating in the study. De Vos, Strydom, Fouche and Delport (2005 p.57) state "Ethics is a set of moral principles which are suggested by an individual or group, are subsequently widely accepted, and offer rules and behavioural expectations about the most current conduct towards experimental subjects and participants, employers, sponsors, other researchers, assistance and students". I assured my participants that whatever they said in the

interview would remain confidential. Names of the participants were not used. Participants were given all the respect they deserved.

Before data collection started, a letter asking for permission to conduct interviews and letters of invitation to participate with consent forms were made available. These letters describing the purpose of the research were delivered to two sampled schools. Principals from the two sampled schools received telephone calls specifying their respective dates and times for interviews and had to confirm their availability. Participants were assured that neither personal identity of the school would be released to the public. This in line with Seale (2012) who points out that the interview should be identifiable only by researcher through a coding system. This assisted in protecting the participants from harm because of participating in the study. Anyone involved in research needs to be aware of the general agreements about what is proper and improper in scientific research (Strydom, 2002).

Data collection did not interrupt participant's normal teaching time. In this study I adhered to the following ethical standards of research:

- The participants were informed about the purpose of this study was to assess the effects of curricula change on the teaching and learning of Mathematics in the foundation phase and that the study will benefit the Department of Education, teachers and learners.
- The participants were also informed that they should participate voluntarily and that they were free to stop participating at any stage.
- Participants were assured of their anonymity and in this regard I further assured participants that their names or identities would be disclosed. Confidentiality was also be ensured by protecting all data gathered and by not making the data available to outsiders.

- All data were stored in a locked cabinet and destroyed after completion of analysis. Electronic data was stored on a computer requiring password access.

- I assured the participants that the participation in this research would not cause them any physical discomfort, humiliation and emotional stress.

3.1.4. Validity and reliability, or ensuring the trustworthiness of the study

De Vos and Strydom (2005), explained that a valid instrument is one that does what it is intended to do. Therefore, to ensure validity of the instrument in this study, the interview guide was used. Therefore, in this study to ensure validity of the instruments, the interview guide was given to my supervisor for comments and suggestions before administering them to the participants.

3.1.5. SUMMARY

This chapter provided details of the research method ranging from research strategy, data collection procedures and the process of data analysis used. The following chapter discusses and makes an analysis of results.

CHAPTER 4

RESULTS AND DISCUSSION

4.1. INTRODUCTION

This chapter presented the findings of the face- to- face interviews. The main aim of this study was to investigate the effects of curriculum changes on Mathematics teaching in foundation phase in Sibasa Circuit. The interview took place at the two primary schools under Sibasa Circuit which were purposively sampled from twenty schools on the basis that they were piloted for National Education Collaboration Trust. Six foundation teachers, two heads of department and two principals participated in the study.

Each thematic discussion consisted of three parts: Claim based on the results, evidence from literature and argumentation based on the findings

4.2. INTERPRETATION AND ANALYSIS

This section presents the analysis of data. The first part focuses on the demographical data and the second part on the analysis of the contextual questions. The analysis was carried out as informed by the themes that emerged from the collected data and guided by research questions.

4.3. DEMOGRAPHIC INFORMATION

The demographic factors of this study are discussed in this section.

4.3.1. Gender

A total number of ten mathematics teachers took part in the study, of whom eight were females and two males.

4.3.2. Teaching experience in years

The teaching experience of the participants are summarised in Table 4.1. below. The schools were coded as S1 - S2 and teachers were coded as T1-T3, and heads of department as H1- H2. For further understanding of the coding, S1T1 = school one teacher one; S2T2= school, two teacher two. This was done so as to make the analysis and interpretation of data collected as to follow:

Table 4.1: Teaching experience in years and gender

Participants	Gender	No of years
S1T1	F	35
S1T2	F	20
S1T3	F	42
S2T1	F	38
S2T2	F	40
S2T3	F	24
S1H1	F	22
S2H2	F	30
S1P1	M	16
S2P2	M	18

More females than male participants took part in the interviews. The participants had teaching experience ranging from sixteen years to forty two years. From the responses in Table 4.3, it could be seen that there were more females than males in

this study who had taught for more than sixteen years. This means that in the sample there were teachers who had been teaching since 1994. Most of the sampled teachers experienced curriculum changes from OBE up to CAPS and therefore understood issues related to curriculum change. Since the advent of democracy in 1994, the South African school curriculum has been characterised by radical changes (DoE, 2009). Most participants said that they could not even implement curriculum 2005 or CAPS because they were trained in the old system. These teachers found it difficult to implement new curriculum because their perceptions, values and beliefs were formed by apartheid curriculum (Bitzer & Botha, 2011).

4.3.3. Qualifications

The following table presents participants' qualifications.

Table 4.2: Academic qualifications

Qualification	Number of participants
BED	3
JPTD	4
MED	1
STD	2
Total	10

Table 4.3 shows the qualifications of the respondents who were interviewed. The respondents had different qualifications that included Bachelor of Education (BED), junior primary teachers Diploma (JPTD), Master's degree (Med) and Secondary Teachers Diploma (STD). Most of the teachers who still held JPTD were female teachers. Only one principal had the highest qualifications, a master's degree. These qualifications may have assisted the teachers to understand the link between personal improvement and the implementation of curriculum changes. Some of these teachers did not qualify to teach Mathematics in the foundation phase, because for one to

qualify to teach Mathematics in the foundation phase because teachers become the rightful foundation phase instructors after obtaining a relevant junior teachers diploma or primary teachers certificate.

4.4. ANALYSIS OF CONTEXTUAL QUESTIONS

Six major themes emerged from the data collected from ten participants. These major themes were categorized into sub-themes in order to present and analyse participant's views.

4.4.1. The following table summarises the themes and sub-themes that emerged from the gathered data and upon which the presentation of data was organised.

Table 4.3: Themes and sub-themes

Themes	Sub-themes
4.4.1 Teachers view on curriculum changes	4.4.1.1.Lack of involvement in decision changes 4.4.1.2. Administration of teaching activities 4.4.1.3.Resistance of change in method of teaching and learning 4.4.1.4.Teacher learner support materials 4.4.1.5.Teacher preparedness to accept change 4.4.1.6.Lack of teachers confidence

4.4.2. Monitoring and evaluation of curriculum change	<p>4.4.2.1. School management</p> <p>4.4.2.1.1. School management knowledge regarding new learning area</p> <p>4.4.2.1.2. Class visits by school management</p> <p>4.4.2.2. Mathematics curriculum advisors support</p> <p>4.4.2.3. Parental support</p> <p>4.4.2.3.1. Parent supervision of their children's work</p> <p>4.4.2.3.2. attending subject meetings</p> <p>4.4.2.3.3. learners absenteeism</p> <p>4.4.2.3.4. late arrival to school</p> <p>4.4.4. support from community members</p>
4.4.3. Teacher training and development	<p>4.4.3.1. Inadequate training</p> <p>4.4.3.2. teachers self-identified need</p> <p>4.4.3.3. Curriculum advisors support</p>

	<p>4.4.3.4. Follow up visits of curriculum advisors after workshop</p> <p>4.4.3.5. Teacher competent knowledge within the new changes</p> <p>4.4.3.6. Continuous teacher development training</p>
4.4.4. Increased class size and workload	<p>4.4.4.1. Individual attention</p> <p>4.4.4.2. Class size</p> <p>4.4.4.3. Time allocated for mathematics teaching</p> <p>4.4.4.4. Discipline</p> <p>4.4.4.5. Feedback on assessment</p>
4.4.5. Forseeable success and failure of curriculum changes	<p>4.4.5.1. Inadequacy of training</p> <p>4.4.5.2. Lack of resources</p> <p>4.4.5.3. Financial constraints</p>
4.4.6. Suggestions for future planning of mathematics curriculum	4.4.6. Suggestions for future planning of mathematics curriculum

4.4.2. THEME 1: TEACHERS VIEW ON CURRICULUM CHANGES

The participant's views on curriculum changes were categorised under the following themes that emerged from the participants responses: Lack of involvement in decision making, administration of teaching activities, resistance of change in method of teaching and learning, teacher learner support materials, teacher preparedness to accept change and lack of teachers' confidence.

4.4.2.1. Lack of involvement in curriculum change decision making

Five of the participants indicated that they were not consulted in the decision making process of Mathematics curriculum changes. In response to this statement, the Mathematics teachers reported in the interview that there was no communication, since they were not consulted, they only received circulars from the Department of Education through schools informing them of the implementation date. Heads of department described feeling undervalued and disempowered by curriculum developers. Teachers described situations where teachers felt left out in curriculum planning and development processes and they felt particularly aggrieved when they had solutions to address the issues. One of the principal indicated that the curriculum developers should have involved all stakeholders when developing new curriculum in order to have ownership and the issue of resources cannot be left out when dealing with curriculum changes in order to implement it effectively.

S2P2: "Department did not view us as important, they did not consulted us. The curriculum developers did not consulted us, but we are the one who are going to implement curriculum in our school"

S1T2:"The curriculum developers did not take us seriously they did not consult us while introducing something new, how can we implement it effectively without any communication with us as implementers".

S1T3: "The Department of Education should at least involve us as heads of department but they decided to keep quiet, how can we involve teachers in our department as a subject head I feel valueless and disempowered because I learn with teachers under my supervision how can they respect me as subject head without any information about my subject I feel that we were left out by the department".

SIT3: "No we cannot implement it effectively, how can we implement it without any consultation by curriculum developers, may be they want to implement it themselves, how can they plan it without us, no, we cannot, they are not treated us well as teachers and they must first involve us as teachers so that we can resolve challenges together for effective implementation".

S2T3 : "The department did not view us as important as we are in the curriculum delivery ,they did not consulted us, they did not take us seriously, we are just like departmental tools, how can we implement this changes without consulting us "

Curriculum development team has to consider the teacher as part of environment that affects curriculum. Without doubt, the most important person in the curriculum implementation process was the teacher (Carl, 2009). The results are in line with the views of Lovat and Smith (2013) who noted that for a change in schools to be successful, there must be more emphasis on the development of teachers and that teachers should understand the reason for change. Wolfson (1997) also acknowledged that it is important to involve teachers in the planning and designing of new Mathematics curriculum. Weber (2008) argued that South African teachers did not see themselves as part and parcel of the transformation in education but regarded themselves as subjects of it. Many changes with reference to curriculum changes had firstly happened without teacher's consultation until their teacher union complained (Peters, 2016). Jansen and Stayed (2012) also noted that teachers were not adequately consulted either at local level, or national level when a new curriculum was formed. These teachers, could therefore, not be able to implement it.

Teachers felt left out in curriculum planning and development processes and they felt particularly aggrieved when they had solutions to address the issues. Teachers described feeling undervalued and disempowered by curriculum developers. Curriculum development team has to consider the teacher as part of environment that affects curriculum. Teachers were avoided in the curriculum formation as the true performers, and could therefore not implement it. Teachers should indeed be involved in curriculum planning and development so that they could own and implement it effectively. Lack of involvement of different stakeholders leads to poor implementation of Mathematics curricula changes. There were also statements indicating that a lack of involvement in decision making devalued teachers' contributions to the extent that they felt there was no point continuing to implement curriculum changes. Teachers should indeed be involved in curriculum planning and development so that they could own and implement it effectively. Lack of involvement of different stake holders leads to poor implementation of Mathematics curricula changes.

4.4.2.2. Administration of teaching activities

Participants pointed out that they were given too much administrative work than preparing for teaching and learning. Participants felt that lesson preparations were demanding. In addition, writing remedial work and intervention strategy, and profiling learners took a lot of their time. The following were remarks from one of the participants interviewed:

S1T3: "I felt that since the beginning of the new curriculum there was too much administrative work, the issue of preparing learners portfolio, new term of profiling learners it was too much for the teacher to prepare it, sometimes I tempted to set simple, poor quality tasks to make sure that learners pass to avoid to write interventions strategies".

Hofmeyer (2012) highlighted that NCS emphasised assessment and administrations tasks, and these overloaded teachers with tasks that are not learning related. The study of Chisholm (2013) state that the use of various forms of assessment lead administrative burden to teachers. In addition, they view NCS as it is more demanding and having more administrative work which affects their teaching time and preparations (DoE, 2012).

Too much administrative work affects teachers' performance and that of learners, because it is time consuming. Teachers might ended up compromising on quality of teaching and learning to avoid writing intervention strategies, Teachers ended up setting simple tasks in order to avoid writing intervention strategies.

4.4.2.3. Resistance to change methods of teaching and learning

Participants emphasized that they are not well invested with the new method and confirmed that they would use old method that they are familiar with .Furthermore, they emphasised that the use of the old method enables the learner to understand them well.

S1T2: "To me I was not sure whether I had changed to the new method of teaching and learning or not as long as learners could follow what I am teaching, what can I do, I do not have any reason for change because I am not well trained to change with this curriculum".

S1T1: "To myself, the new method confused me and I decided to use the method that I was familiar with and which learners understood well".

The results are consistent with the study of Machaba (2016) who found that change arose emotions and despair in both teachers and learners, but it could also raise hope, growth and progress if well maintained. In support of this view, Coffey (2015) stated

that traditional teaching approach is still valuable on the other side because it provides teachers with a chance of implementing the proposed mathematical knowledge.

It also appeared that teachers are not willing to stay away from their old method because it enables them to teach well. The results showed that the new method confuses them and they decided to use the original method of teaching and learning, this led to poor implementation of mathematics curriculum changes.

4.4.2.4. Teacher-learner support materials.

Participants stressed the fact that the implementers of new curriculum should often consider the issue of teacher learners support materials. They also highlighted the fact that it is time consuming and affect their progress. They indicated that it is time consuming and affects their progress. It is not easy to teach a foundation phase learner without workbooks to write on. More time was spent on improving resources rather than teaching which teachers regarded as critical. Giving learner homework, teachers are expected to write on the chalkboard which is time consuming and frustrating. One of the participants said:

S1H2:” It was not easy to teach learners in class where there had been shortage of resources, because when you wanted to give a homework you must first write on the chalkboard, then a foundation phase learner takes time to copy on the chalkboard. Therefore it takes more time of teaching and learning which end up not finishing the content coverage as you know that CAPS guide us what to do each and every hour of a week without finishing what is expected today you can’t really make it on the following day it frustrates us as teachers,Hel...! Feel that...., another issue is shortage of learning materials which act as a key factor which hinder the successful implementation of mathematics curriculum change”.

S1T3: "Teaching a foundation phase learner without resources, when seeing others holding theirs they even want to take it from those who have counters the worst part of it they do not want to share resource with others therefore it takes time to make sure that the learners participate in the classroom activities".

These results are in agreement with those of Chisholm (2000) who observed that disadvantaged schools lacked resources critical for successful implementation of the new curriculum: stationary, textbooks. Photocopying facilities and other teaching facilities. Lack of support materials was the most challenging factor which affected curriculum implementation (Kirkgoz, 2008). In addition, Jansen and Tailor (2013) stressed that insufficient facilities affect the implementation of curriculum.

Participant's stressed that the shortage of resources such as workbooks, counting blocks, games and training of teachers, which were suggested by the new curriculum, hindered effective implementation of mathematics curriculum change. Successful implementation of curriculum changes needs teacher learner materials.

Principals, heads of department including Mathematics teachers show that the shortage of learning materials are the key factor that hinder successful implementation of curriculum change. It seemed as if the conditions of classes were not conducive to the implementation of curriculum changes. Participants are worried about learning resource which is the main problem in implementing curriculum effectively

4.4.2.5. Teacher preparedness to accept change

Participants indicated that they thought that they were not well prepared for the change in order to be successfully implement the Mathematics curriculum change. The reason being that change was good but it should be gradually faced in. They think that if changes in curriculum are faced in gradually, they would benefit all teachers as some are facing challenges. Teachers regard Mathematics as a demanding subject.

Change is a phenomenon that affects all aspect of person's life and brings about alterations in both personal and employment spheres. Some principals confirmed this and remarked as follows during interviews:

S2P2:" Changes should have been taking place slowly because teachers were faced with the challenges of new policies that are introduced one after another. Teachers ends up being confused because when they thought their struggle with RNCS was over, they were now expected to deal with another policy change .I am not prepared for all these changes, changes should be gradually faced in the process. These changes affecting teachers to proceed smoothly with their work as Mathematics is the most demanding subject".

These results were in agreement with literature which states that the curriculum changed change rapidly which led teachers not well trained. (Jansen & Stayed, 2012). Educational leaders should use logic to get potential implementers to see the need for a curriculum change (Fullan, 2001). In addition, Fullan (1991) stated that successful reform necessitates teachers that are ready to change, and teachers that have the required resources to implement and sustain change. These results suggest that some teachers were found not ready to manage changes in curriculum because they feel that changes should be gradually faced in.They end up being confused because Mathematics is a demanding subject. Thus successful implementation would take place if conditions were made conducive for the Mathematics teachers.

4.4.2.6. Teachers' lack of confidence

Participants were asked if they encounter any difficulties experienced by Mathematics teachers regarding the implementation of the Mathematics curriculum. Both principals identified low self-confidence of the teachers as a cause of the ineffective implementation of the new curriculum. Participants think that teachers do not have the courage to teach Mathematics in the foundation phase. Principals interviewed stated that teachers fear teaching Mathematics so much that they would not even like to visit

the principals' office to talk about anything that has to do with Mathematics. The following remarks by principals confirm this:

S1P1: "Teachers do not have confidence to teach Mathematics in the foundation phase, they feel they are not doing enough for the learners, they even mention that grade three class ,is like grade twelve class, even myself as a trained teacher, they are unable to answer Mathematics question paper set during workshop training, no one obtained the total mark. They also afraid of monthly common paper which is set by district official for grade three learner. When asked them to submit Mathematics exercise books to the office for monitoring, you can feel for them, they can even start shivering. No, no..... this teachers they are not sure of themselves, I wonder what they are doing in the classroom they are really killing our learners".

The results of the study are in agreement with the study of Stuart, Justin and Patrick (2009) who indicate that it provides opportunities to develop teachers self-efficacy and thus to change teachers behaviours making them more able to use innovative pedagogies and more confident to take learners beyond the confines of the classroom.

Teachers' inadequate Mathematical skills and weak conceptual knowledge caused them to have low self-esteem regarding the implementation of the new teaching methods. They think that the new curriculum is meant for the in-coming teachers from training. They do not even want to try new methods of teaching as required by the new curriculum. Principals indicated that teachers do not want to teach Mathematics because they are afraid of monthly common tasks set by the department which are set without any discussions with the teacher concerned. Therefore it hinders the effective implementation of curriculum change.

4.4.3. Theme 2: Monitoring and evaluation in the implementation of new curriculum

Participants were asked if they had received any support from the School Management teams regarding implementation of Mathematics curriculum. Teachers

responded that they did not receive support from school management teams, while heads of department responded that they did not receive support from the Department of Education, they further stated that no workshops for heads of department and principals to monitor curriculum changes were convened. The responses of the participants on monitoring and evaluation of curriculum changes were categorised under the following themes. The themes emerged from the participants responses: Monitoring by school management, parental support and support from community members.

4.4.3.1. School management

A crucial factor in the implementation of changes in the Mathematics curriculum was the leadership role of the school management team.

4.4.3.1.1. School management knowledge regarding new learning areas in mathematics

Participants think that training is critical each time a new curriculum is introduced and expressed the need for well-trained school management team that could deal with the complete Mathematics curriculum support. Participants re concerned about the newly appointed SMT members that they should be trained immediately so that they can be able to monitor Mathematics curriculum.

Teachers indicated that the school management team did not offer enough support to them. The school management team displayed behaviours such as not monitoring how the curriculum was being implemented in the classroom. The only support that was given, if any, was the provision of curriculum policy documents, furthermore, management allowed teachers to attend mathematics workshop, without any sign of interest from management about what was happening at the workshops. Teachers indicated that the management had little to no idea about what is happening in the

classroom, they just put the stamp on learner's exercise books without checking whether I have covered all content supposed to be covered during that term. They further believe that they are less qualified to teach because do not have experience in teaching the changes in the mathematics. The management relied on the knowledge that teachers were implementing in the classroom that were taught by curriculum advisors during training because by themselves they know nothing what is happening in curriculum delivery

The principals and heads of department interviewed indicated that they did not receive support from the Department of Education, they further indicated that they did not receive any training related to curriculum monitoring. They highlighted the issue of not having an adequate understanding of the curriculum changes which is hindering their ability of knowing what is expected of them, which inevitably causes confusion as to how to support their teachers in the process of implementing the new curriculum.

S1H2: "The management never receive training to monitor curriculum changes, neither specialised with mathematics, especially we as new appointed heads of department, so it is difficult for them to monitor Mathematics curriculum changes we should have receive training immediately after appointment as subject head so that we can be able to monitor changes we relied on the knowledge of teachers that they are getting from workshop."

S2P2: "Support from the department of education is not enough they should provide us with enough training especially curriculum related matters".

S2T1: "Support we are getting is not enough for us for successful implementation of curriculum change, I believe management team are not specialist in Mathematics as subject".

S2T3: "I think the support we are getting from school is not enough, management know nothing about what is happening in the classroom situation, however moderation of

learners scripts at the end of the term was just a matter of running over the teachers ticks without checking the memorandum and whether the number of ticks correspond or not they just do it for compliance”

S1TT3: “We are not supported, they only allow us to attend teacher’s workshop, they do not care what is happening in the training and even what is happening in the classroom, and they only provide us with policy documents, what happened after, they did not care”.

These findings are in line with those of Dsouza (2006) who established that evaluation is a useful means of determining whether the person has carried out his tasks, whether a person is helping to achieve set objectives or not. Assuming that no one is perfect and therefore everyone has a room for improvement. Fullan (2001) argues that evaluation is an inherent part of good teaching, and that every teacher no matter how good and how poor has the potential to get better over time.

Mathematics is the subject that requires abstract thinking, because teachers are continually confronted with the new ways of solving problems. Teachers need to be monitored by the school management team for the effective implementation of curriculum changes. This means that School Management Team as key figures, around which many of the schools’ activities revolved, and to a great extent determines the schools’ success or failure when changes are wrongly implemented. For successful implementation of mathematics curriculum, the school management team should ensure that they provide teachers with the necessary documents and implementation guidelines.

4.4.3.2. Class visits by school management team

The participant interviewed showed that school management team visits their classes during summative evaluation on the fourth term for the purpose of IQMS. Teachers response showed that class visits were not popular because it is done once per year.

S1T3: "The school management team visits our classrooms only during IQMS summative evaluations. Surely they are not supporting us as teachers we should receive regular visit by the management team they simply rely on the workshop that we have attended, they know nothing of what is happening in the classroom situation, only once per year.....mmm. They are not supporting us this people."

S2T2 : "The heads of department only visits my class once per year with regard to Integrated Quality management System ,how can they say they are supporting us, only once per year ,no....they are not supporting us".

The results of the study are in agreement with the study of Badugela (2012) who indicated that, school management should conduct class visits and give support to the mathematics teachers for the proper implementation of mathematics curriculum changes. In reality, an educational leader should lead in implementing curriculum instead of staying in his office and doing nothing ((Van der Horst & McDonald, 2014).

Results from interviews showed that teachers were not getting enough support from school management. The management relied on the knowledge that teachers were getting from the workshops. They do not do class visits, they do not know what was happening in the classrooms. It is clear that class visits were not very popular and should be regarded as a concern for the purpose of effective teaching and learning. The school management only check the number of formal tasks written at the end of the term only for being compliance with the district priority areas. Furthermore, they only checked whether we were teaching in the classroom, not knowing what we had been teaching was in line with what should be taught during that week, as CAPS

stipulated what to teach every day they knew nothing about mathematics policy document. For successful implementation of mathematics curriculum, the school management team should ensure that they give full support to teachers, conduct regular class visits and provide teachers with the necessary documents and implementation guidelines.

4.4.3.2. Mathematics curriculum advisors support

The participants indicated that their knowledge and expertise regarding the curriculum was not thought of highly by the curriculum advisors which resulted in them not being able to provide an adequate level of support their teachers in the process of implementing effective changes in curriculum. One of the heads of department mentioned that she feels disempowered by teachers because she knows nothing on how to monitor curriculum in her department due to not having enough training by curriculum advisors.

One of the principals indicated the provision of training to school managers will have a positive effect on the on the teaching and learning of the new Mathematics curriculum. She also indicated that her skill of not knowing is not taken seriously by the curriculum developers. Teachers are concerned about the duration of the workshop meetings, furthermore, they are concerned that the solutions that are being provided at the workshops will be inadequate in the effective implementation of the curriculum changes. They further mentioned that there is no after training workshop to see what is happening in their normal classroom situations.

Three of the participants interviewed commented that:

S1H1:” I did not have an idea on how to monitor Mathematics curriculum, what i did was to collect learner’s book and counted the number of tasks only for compliance, I

feel disempower by teachers, how can I to monitor them without any clue of what is happening in Mathematics curriculum changes”.

S2P1:”I feel that training for the school managers is very important for effective implementation of Mathematics curriculum, the main issue is that they are not trained by the curriculum developers to monitor those changes, the skill of not knowing what is happening in the curriculum is not taken seriously by curriculum developers..

S1T2 : “As teachers we are worried about the workshop that were attended for a short period of time, and the training is not enough to can implement curriculum effectively, the worst part of it is that there is no after training workshop by curriculum advisors to see whether we implement it correctly in the classroom situation”.

These results are in line with the study of Linnemanstons and Jordan (2017) who found that teachers should be supported and assisted by well-structured professional development for effective curriculum implementation. Furthermore, the study of Linnemanstons and Jordan (2017) indicate that teachers without mathematical background struggle in mathematics curriculum to instil mathematical knowledge to their learners. According to Barrows (2015), curriculum never mind how dignified or specific it has been formulated, cannot be well implemented unless it has been through the supervisory function of all the concerned educational stakeholders. Marishane (2016) also holds the view that once workshop, seminars and conferences in this regard are held under the guidance of the experts in educational matters, the implementation could bear fruitful results. The continued visits to schools by subject advisors might also be of help if well applied.

The participants indicated that they do not know what is happening in the classroom. The curriculum advisors did not organise training workshop for them. From the participants’ view, the curriculum advisors did not do after workshop visit to see what is happening in the classroom situation for effective the implementation process of mathematics curriculum. Mathematics teachers implemented curriculum on their own without the support, encouragement and assistance from the curriculum advisors. The

results show that there was no monitoring of teacher and learners in the implementation process from the curriculum advisors. It results on them not being able to support their teachers on the implementing of mathematics curriculum change.

4.4.3.3. Parental support

In responses of the participants on parental support from the interviews is categorised under the following themes. Themes emerged from the participants' responses.

Parent supervision of their children's work, attending subject meetings, learner's absenteeism, late arrival to school and support from community members.

4.4.3.3.1. Parent supervision of their children's work

Two of the participant stated that support from parents was very poor, they did not want to supervise their children, whether they have done homework or not. They further indicated that parents think it was the teachers' responsibility to teach their children.

S1P1:" Parents are home teachers they should supervise their children whether they are doing homework or not they should always supervise their children work and discuss any of learner's difficulties with the teacher".

S2P2:" Parents did not involve themselves in educational activities of their children, they did not check what had written in their learners' books, whether they are homework given or not, they thought it was teachers' responsibilities".

The results of the study are in agreement with the study of Moloi (2016) that parental responsibility is to remind their children while at home, about pending school activities on everyday basis

4.4.3.3.2. Attending subject meetings

Four of the participants interviewed indicated that parents did not attend subject meeting when invited. Teachers indicated that parents signed partnership agreement form E146 just to let their learners progressed to the next grade, on the following year they are nowhere to be found to attend the meeting for supporting their learners. One of the principal commented that parents are only interested in having their children pass examination, when invited to come and discuss their learners progress they are nowhere to be found, They further stated that parents did not want to provide teachers with the necessary supplementary materials related to subject matter, they argue that it is teachers duty and they have no time to attend parent meeting because they are also workers. They commented that:

S2T1: "Parents did not support us as teachers, they did not come to school when we call them to discuss their learner's progress so that they can support their children at home".

SIT2: Parents did not attend subject meeting of their children in order to discuss learners progress, this lead to ineffective teaching and learning, because teachers do not know what to do to assist learners concerning difficulties in their subject after school, it frustrate and demotivate teachers because they do not know what to do in the following day to assist the learner"

S2T2 : "In order for a learner to qualify to progress to the next grade due to age cohort, parents need to complete partnership agreement form E146 to confirm whether they allow their children to progress to the next grade or not, provided they will give the child the necessary support, even though they sign that form, they will not give teachers the

support that they have mentioned, for them to sign the form it only means their learners have passed to the next grade, in the following year they were no were to be found to support us .Yaaaaa...we are not getting enough support from parent”.

S2P2: Parents are particularly interested in having their children pass examinations. Whenever you invite them to discuss about how they could assist to help their children learn for instance by guiding them to read supplementary materials on content stated in the syllabus, they would argue that it is teachers’ duty, we are not teachers they have trained for teaching our learners. If asked them to discuss their learner’s progress they would say they have no time, they are workers”.

Parental support as their kids grow is one of the most important aspects, parents are their children’s learning models (Miller-Jones (2015). Parents needs to be the positive role model for their own children so that they could shape up opinions and also attitude towards learning (Sybil, 2018). Colorado (2015) also supported this view, by stating that a family does towards a learners’ education counts more than how much money or how much education parents have.

The results showed that parents did not attend subject meeting of their children, which lead in ineffective teaching and learning and demotivate teachers if they did not get support from parents. They did not know where to assist learners concerning difficulties in their subject.

Even parents with those learners who qualify to progress to the next grade due to age cohort, they just sign partnership agreement form to allow their learners to progress to the next grade at the end of the year. In the following year they were nowhere to be found to attend support meeting for their children who progressed to the next grade due to age cohort. Learners who qualify to progress need support from both parents and teachers in order to improve in their learning process.

Parental support can determine success and also displays deficiencies and challenges encountered during Mathematics curriculum implementation. Parents who play supportive role to their children learning and it is helpful for improve learner's achievement and changing behaviour, parent's support for their child learning can make good implementation in Mathematics curriculum.

4.4.3.3.2. Learner absenteeism

The participant mentioned the issue of absenteeism, the parents did not encourage their learners to attend school every day.

S2T3 : "Parents did not support us ,they did not wake up their learners to come to school before they go to work ,their children remains sleeping and forgot to come to school when they wake up, by then their parents had already gone to work"

S1T2: "Learners who absent himself from school without any reason was in trouble of not completing school based assessment tasks which was very important for the progression of learners parents should encourage their children to come to school every day of the week".

S1T1:"Learner who is absent do not have all meaning of what the teachers say in class while teaching because when teachers teach in class and come across difficult concepts they explain it many times and also give examples, until they see that learners understand it well, it is good to attend class every day in order to have contact with the teacher,.....it also easy to remember what he taught if you see him talking in the class".

Absenteeism contribute to low level of achievement in class (Spradlin, 2012). The results showed that teachers were not getting enough support from parents.

Apart from the support that parents could offer to their foundation phase learners, absenting oneself from school today is an invitation of more troubles. The reason is that, the school based assessment tasks count a lot in the promotion of the learners to their next grade.

The effects of absenteeism in classroom activities lead to poor participation in the following day because learners misses chance to become a part in class participate, cannot raise questions about any confusion regarding topics. Learners who are always absent cannot master all mathematics concepts and become bored which lead to ineffective learning. Learners tempted to copy classroom activities from their classmates because they knew nothing about what was taught the previous day, which lead to poor preparations of classroom activities. Due to absenteeism the teacher had to reteach lesson and it took instructional time away from learners who regularly attend classes. They also missed the interaction and benefits of specific examples which were used to explain difficult concepts because some of the valuable information was not repeated.

4.4.3.3.2. Late arrival to school

Participants were concerned about learners who arrive late at school and also looking tired. These learners were unable to concentrate on their school work. What was clear from one of the responses of the school principal is that parents had limited knowledge about the roles and duties of parental involvement in curriculum matters. They do not encourage their children to come to school early as confirmed in the following statement during interview:

S2P2: "Parents did not encourage their children to come to school early, it is important for learners to develop good habit of early arrival at early age".

S1P1: “Parents send their children to accompany their siblings to the crèche in the morning before they come to school which makes them arrived late, they did not care whether they arrived on time or not”.

S1T3: Parents let their children cook for themselves in the morning, they arrive late and being tired, they cannot concentrate well in the classroom, we keep on wake them up in the classroom, which reduce minutes of instruction for other learners”.

S2H2: Parents send their children to carry water away from home with big baskets on their head before they come to school which makes them arrived late being tired, they keep on yawning which disturb the whole class because other learners keeps on looking at them, which takes attention of other learners”.

Learners who arrive late miss out on important announcements and activities (Cinderella, Christensen, Young & Densely, 2011). They also miss out activities when arriving late at school. Learners, especially foundation phase learners rely on their parents to get them to school on time. Late coming reduce the minutes of instruction for all learners enrolled in class because the minute the late comer enters the class, the teacher must divert their attention away from regular teaching time and towards remediation. The learners who are already in class are adversely affected and classroom instruction is slowed by this disruption. Therefore, there are negative effects on learner’s attention when one learner enters classroom during learning situation.

4.4.3.3. Learner support from Community members

I asked the participants whether they receive support from the community members. Two of them indicated that they did not receive support from community members instead they vandalise the school property and even stole learner support materials.

S1P1: "Resources are very scarce but community members stole books and computers which assists us how can we implement curriculum effectively.

S2P2: "The computer laboratory donated by local businessman was vandalised by some of the community members, they stole textbooks, computers, photocopying machines, they do not care".

S1T2: For sure, the reality of the community to support the curriculum was hampered by the community vandalism, stealing books and computers from our schools.

Communities have played a relatively passive and isolated supporting role, especially in curriculum implementation matters (Ciaccio, 1999; Barnhart, 2006; Swift-Morgan, 2006). Many educational innovations are anchored on the strong foundation that communities are part of an existing learning landscape. When communities have a visible presence in the classroom, the learners are more likely to see meaningful connection between their learning and their eventually success in the community (Howley & Maynard, 2003). The role of the community is to support the schools materially and financially, but more specifically, collaborate with the teachers to produce new knowledge and ideas (Bull, 2011). Parental involvement but in a bigger picture is to see the whole community as a multi layered system capable of reforming and transforming classroom practice (Ngwenya, 2010).

The success in the implementation of curriculum require resources. However, most often teachers complain that resources are very scarce. The community members and materials in the existing local community very well substitute for what are needed to implement the curriculum. Results from the participants show that the reality of community support in curriculum implementation was hampered by community vandalism, stealing textbooks and computers. Therefore, lack of support by community members lead to poor implementation of mathematics curriculum.

4.4.4. Theme 3: Teacher professional development

The responses of the participants on teacher training and development from the interview categorised under the following themes. Inadequate training, Teachers self-identified need, Curriculum advisors support, Follow up visits of curriculum advisors, Teacher competent knowledge within the new changes and continuous teacher development training.

The following are the discussions of the sub themes emerged from the above participant's responses:

4.4.4.1. Inadequate training

I asked the participants whether teachers received any training relating to the new curriculum. Participants agreed that the training they received was not enough. Teachers indicated that the inadequacy in training hinders the implementation of curriculum change. They further explain that training was poor, we need more training and guidance in order to address the gaps that still exist regarding implementation of mathematics curriculum changes. They also mentioned the issue of prolonging training for at least one to three days training. Training should address the needs of the teachers. The training for CAPS usually took only two to three days. One of the participants responded that:

S1T3: "They gave us training for only one day about new content to teach new topic, they should prolong the thing, may be for one to three days training is not enough".

S2T1: "Training should be hands on training so that we can acquire the necessary skills to teach mathematics".

S1T3: Training should be between eight and four in order to fill the gaps that are still exists regarding the implementation of mathematics curriculum”.

One short workshop is not effective for implementation of new curriculum (Fullan, 1991). Marsh and Willis (2015) held the view that rural teachers received a three to five days’ workshop before the implementation of new curriculum. Flores (2016) believe that teacher training and educational programmes do not respond adequately to the changing nature of teaching and learning. Teacher training offered as short term programmes which takes few hours with limited after training school visits.

Teachers need to be trained in such a way that they can develop their own resource materials and this need time for teachers to prepare and construct classroom resources. Teachers are concerned about the relatively short durations of the training workshops, furthermore, they are not impressed with the contents of the workshops. Therefore, inadequate training of teachers makes it complicated for teachers to learn what is expected from them. Teachers require sufficient curriculum support and an extension to the training received by subject advisors. The mathematics curriculum is often ineffective if teachers do not understand the curriculum change. The quality of professional development was necessary to ease the implementation of new changes

4.4.4.2. Teachers self- identified needs

Participants in this study agreed that the importance of professional development in the form of differentiation between the needs of the teachers was of most important. Three of the participants commented that:

S2H2: “Workshops should focus on specific sections. Teachers must be asked their challenges so that they should focus on those aspects”.

S2P2: "Professional development should cater the need of individual teacher were felt they need the most improvement according to their capabilities for the effective implementation of curriculum changes".

S1T2: "I have registered with the university in order to improve my skills of teaching and learning mathematics, because I have noticed that the training that we receive is not enough, I knew where I lack my content knowledge that's why I decided to improve my teaching skills through the university"

Professional development should respond to teachers self-identified needs and interest in order to support individual and organisational improvement. Professional development is more meaningful to teachers when they exercise ownership of its content and process (King & New Mann, 2000). Teachers were hoping to have new type of professional development workshop which updated and enhanced their instructional capabilities in the areas that they felt needed the most improvement. Due to constraints budget from the department of education, it becomes extremely hard for teachers to get resources provided by the department. It was clear from the interviews that teachers' attitudes, including eagerness' to learn new things and openness to new ideas and approaches, is one of the major factor affecting teachers' behaviour during professional development.

The teachers interviewed for this study were proactive and more than willing to acquire resources needed for improving their own learning and teaching experiences. Both teachers knew their area in which they needed improvement for them, to attend the training workshop which address the general issues is like waste of time. The teachers explained that the in service training they received did not prepare them well for implementing mathematics curriculum. Teachers register themselves to the university in order to improve their teaching skill and have subject knowledge. Curriculum advisors should be well prepared for the workshops, training sections and educational conferences so that teachers benefit from those trainings.

4.4.4.3. Curriculum advisors support

Two of the participants indicated that curriculum advisors did not visit them for professional development due to shortage of curriculum advisors in the foundation phase. Following are their remarks during interview:

S1H2: "Curriculum advisors did not visits them, they concentrate mostly in the feeder primary of underperformed secondary schools due to shortage of staff".

S2H2: "Curriculum advisors did not visits my school when asked they said ,The number of curriculum advisors in the foundation phase is not enough ,they have allocated five circuits per curriculum advisor ,so it is not easy to visits each and every school, they did not give us enough support".

Literature reviewed show that in order for teachers to rectify mistakes done in mathematics class, support from curriculum advisors is needed. (Mdutshane, 2006).

Responses by the heads of department indicate that the capacity of curriculum advisors might be the cause. The subject advisors are incapable of nurturing the heads of department in the processes involved in the implementation mathematics curriculum changes focused mainly on the rural areas. Heads of department should be trained as teachers in order to be able to monitor curriculum changes. Staff shortages lead to low levels of job satisfaction and delayed effective curriculum implementation. The issue of one curriculum advisors per circuit should be addressed in order for curriculum advisors to be effectively support teachers for effective implementation of mathematics curriculum changes.

4.4.4.4. Follow up visits of curriculum advisors after workshop

The participants mentioned that follow up from curriculum advisors was non-existent, and one participants mentioned that:

S1H2: "The curriculum advisors did not visit us for follow up of what they taught us in the workshop to see whether what they have teach us we implement it in the classroom situation".

S2H1: "Curriculum advisors did not support teachers, they did not do follow up to see whether they implement curriculum effectively in the classroom situation "

S1T2: "The curriculum advisors did not visit us to do follow up, and as teachers we do not know what to do, because sometimes we forgot everything that we have learned during training, it really frustrate us"

The results of the study supported by Mamosa (2013) who states that training sessions that were presented and with no follow up made are not suitable and results in poor implementation of mathematics curriculum. In addition, the study of McNeil (2004) noted that many workshops and conferences led to few significant changes in teachers practice when they returned to their classroom.

The challenges that were presented by the school management team is that curriculum advisors fail to provide support to teachers. The argument presented by school management team is that there is lack of teachers monitoring and support by curriculum advisors in schools for those teachers who are returning from the workshop in order to assess their progress. The failure to conduct follow up visits by curriculum advisors and to provide advisory services to teachers affects the mathematics curriculum implementation and leads to frustrations and incorrect implementation of new curriculum.

4.4.4.5. Teachers competent within the new changes

Participants have revealed that they did not have adequate skills required for the successful implementation of new curriculum change, consequently, resulting in the obligation to return to the old ways of teaching and abandoning the new methods. Regardless of the fact that they were instructed on how to teach the new curriculum, they had received criticism in the plenty because they had been using methods that learners were not familiar with. One of the participants commented that:

S1T3:" I understood how to teach in the new curriculum only for some days after workshop, later on I forgot everything and went back to normal teaching".

S2T1 :In one workshop training for teachers, curriculum make them to write a grade 2 mathematics test before the training start, no teacher obtain the total mark this means that we are still far behind with content knowledge this shows that teachers in the foundation phase are incompetent with the new knowledge of curriculum changes"

S1T1 :When it comes to setting of test ,we keep on struggling on how to frame the question which will include all aspects we fail to outline in each learning outcomes, as given in the subject policy, teachers just take the previous question paper and make cut and paste and let the learners write as it is"

"Good preparation for a lesson...., is always a new small scale and provisional constructions as well as a synthesis of prior experience....., while at the same time recognizing that, in the end, each and every lesson holds in store a myriad unforeseeable possibilities and that the openness of teachers minds to new situations, impulses, and the difficulties arising from the moment is a criterion for their pedagogical competence" (Klafki, 2000 p.143)

For teachers to be able to meet the expected standards when it comes to curriculum delivery, they have to be competent within the new curriculum in order to produce the necessary outcomes. An example of this effect is assessment. Teachers are unable to set questions for their formal tasks they rely on previous set provincial and national question papers. They fail to outline in each learning outcomes, as given in the subject statement policy of a mathematic subject and the subsequent examination questions. They even fail grade 2 question paper set for them during training workshop. The emphasis on the new curriculum is on assessing both the skills acquired and the knowledge of the content taught. . Their knowledge of the new curriculum appeared to be limited, which led to poor implementation of curriculum change.

4.4.4.6. Continuous training

Two of the participants mentioned the issue of continuous training and development so for teachers to implement curriculum effectively. One of the participants commented that:

S2H3: "Teachers should be engaged in professional learning on a continuous basis"

S2H2: "Teachers can simply forgot what they have learnt during training, so the training for teachers should be done continuously in order to equip them with the necessary skills for effective implementation " .

Curriculum changes require teachers to engage themselves in continuous professional learning on a continuous base (Nunatall, 2012). Lack of in-service training and lack of continuous workshops for teachers were among the factors that created difficulties in implementing a curriculum successfully (Bandeke & Faremi, 2012). Lumadi (2014) argued in favour of an extension of these training sessions or for the training process to become continuous.

Mostly teachers learn to forget therefore they should be engaged in continuous professional development in order to implement curriculum effectively. The continuous training equips teachers with the necessary skills that are needed in curriculum delivery. It was very important for the teachers to be provided with appropriate skills and sound knowledge prior to the implementation of new curriculum and therefore it should be continuous.

4.4.5. Theme 4: Increased class sizes and workload

In response to overcrowded Mathematics classrooms as a results of implementing mathematics curriculum, participants agreed that classrooms were overcrowded. The responses of participants on overcrowding classes and workload from the interviews were categorised under the following themes. These themes emerged from the Mathematics teachers' responses: Individual attention, class size, time allocated for Mathematics teaching, discipline and feedback on assessment.

The following sub themes emerged from the above participants' responses:

4.4.5.1. Teacher-learner ratio over crowdedness

Participants indicated that the classrooms are overcrowded to an extent that some learners find it difficult to pay attention to the teacher or Mathematical concepts that are taught.

4.4.5.1.1. Individual attention

The participants indicated that in overcrowding class we find it difficult for teachers to provide support and individual attention. They further indicated that their skill become

blurred with other learners because to attend each and every learner in overcrowding class you should double their efforts and also the issue of not easy to identify the strength and weakness of learners. They commented that:

S1T2:" It is not possible to attend each and every learner in overcrowding class, it is impossible to spend all time in one learner what about others, a learners skills become blurred with other learners, to attend each and every learner in overcrowding class you should double time allocated and it is impossible to identify strength and weakness of a particular learner".

These results are similar to the findings of Sidiropoulous (2008) who reported that teachers could not give attention to individual learners because they were so many of them in one class, learners were weak in Mathematics and they required individual attention. Cobb, Yackel and McClain (2013) indicated that individual attention in smaller classes, were a more active role for both teachers and learners.

The larger the class the less time the teacher will have to spend with each learner. In large classes, teachers have to double the time spend in individual attention which is impossible. In large classrooms it is difficult for teachers to stay on top of the strengths and weakness of a particular learner. In normal class, teachers might be able to individualise learners in a particular area. However, in overcrowding class, the individualism of learner's skills becomes blurred with other learners. Larger classroom results in less individual attention from the teacher and it would not be able to identify the strength and weaknesses of learners in an overcrowding class the way they would in a normal class.

4.4.5.1.2. Class size management

Three of the participants indicated that overcrowding class affects their way of teaching in such a way that they do not know which methods they may apply.

The study of Schanzenbach (2014) suggests that increasing class size will harm not only learners' academic results in a short run, but also their long term success at school and beyond. Money saved by not decreasing class size may result substantial social and educational costs in the future.

S1T2: "In my point of view I do not know which method I should apply to manage all learners who are over populated"

S2T3: As a teacher I am worried about marking the tasks of the whole class in time, it takes two to three days to mark tasks, this affects teaching and learning because learners will end up not getting sufficient knowledge, it is difficult to manage overcrowding class, I feel much stressed and become tired".

S1T1: I do not know how to do remedial teaching because the class is too large, it can take a week before I take another group to do remedial, and I feel overwhelmed with work due to large number of learners in one class. Which means it is not good for learners to be in overcrowding class but learners in a small group performed better.

Moreover, Cooney (2015) also stressed the point that the class size issue in respect of how teachers work, could played a paramount role in helping learners to learn Mathematics the easy way. Gultig, Hoadley and Jansen (2016) also acknowledged that class size also affected concentration attitude that always becomes a troublesome issue than in large classes.

The study revealed that high teacher learner ratio leads to low levels of mathematics curriculum implementation in the foundation phase and increase teacher workloads and absenteeism due to stress work related matters. In this study the Mathematics teachers believed that it was difficult to manage effectively Mathematics class with large number of learners. Mathematics teachers feel overwhelmed with work due to increase in the number of learners. There are both fast and slow learners in one class which makes coverage of mathematics curriculum difficult. Remedial teaching for

mathematics is not possible given the large number of learners at foundation phase. The overcrowding environment is not conducive for teaching and learning Mathematics therefore it hinders implementation of Mathematics curriculum. The findings of this study revealed that learners who learnt in normal class size (NCS) performed better than the learners in overcrowded class size.

4.4.5.1.3. Time allocated for mathematics lessons

The participants indicated that time allocated to Mathematics lessons on the time table was not sufficient, in mental Mathematics: counting allocated 5 minutes, mental Mathematics activity allocated 10 minutes, corrections or reflection on homework 15 minutes, lesson content 30 minutes which is not enough to unpack all the content coverage of that day. Two of the participants confirmed that:

S1T3: "In large classes time limit the teachers to complete the pace setters, if you try to cater each and every learner in your class, learners could spend short time in listening to teachers but more time is needed using the provided resources to provide information which is needed, for example when learners use counters to add numbers it will take time, to make them understand what they did wrongly it need more time".

In support of this results the study of Chikumbu and Makamure (2013) revealed that effective curriculum implementation could be achieved through allocating enough time to subjects taught at schools and creating an atmosphere conducive for effective teaching and learning by the department of education. Francis (2017) pointed out that for teachers, time seems to be always short for them whereas they are expected to do a large amount of work. Only learners could rather spend short time in listening to teachers but give more time to using the provided resources, if properly utilised, it could help them to understand and retained the provided information easily (Gultig, Hoadley & Van de Walle, 2016). The research study conducted by Carr (2015) revealed that fact that although the class size did not change the degree of

individualisation, it helped teacher to spend twice the time used per learner as compared to larger classes

The study revealed that time allocated for mathematics lessons on the time table is not enough to cover the content in time. Participants felt that if the duration of lessons content minutes could be increased to at least 40 minutes, it may create room to assist all the learners and complete the pacesetters on time for effective implementation of Mathematics curriculum.

4.4.5.1.4. Discipline

The participants indicated that large classes had an enormous effect on the case of class management. They added that large classes were always associated with noise or other thought of disturbing instances, which ended up breaking up the concentration spirit. Three of the participants indicated that:

S1T3:” We experienced disciplinary problems in the mathematics classroom due to the large number of learners in the class, this was time to make learners pay attention while teaching, it means you have to pause a little bit, then time is not on our side it is going”.

S2t1 : “In large classrooms there is no space to move in between the rows checking them what they are doing and this contribute for them making noise in class because they know that you do not see them and this make them not to concentrate in the lesson presented ”.

S1T2: “Overcrowding class causes teachers stress because they will keep on reprimanding learners who disrupt the class during teaching, the noise level in a large class adds teachers stress level, the noise really disturbing especially when you are in this class for the whole year”.

In support of this study Copley (2016) states that teachers with large classes, use the class time for disputes settlement which indeed resulted in consuming time unnecessarily. Moloi (2012) indicated that the learners lost a culture of respect and trust towards the teachers. Learner's safety security and success in education was often adversely affected by disruptive behaviour or other forms of misconduct by fellow learners. Hoadley and Jansen (2016) also acknowledged the fact that larger classes were always associated with noise or other thought disturbing instances, which ended up in breaking up the concentration spirit.

Lack of physical space of movement around the classes, retards the learner's opportunities of concentrating fully in lessons being done, they make noise. A lack of learner discipline may seriously hamper the teaching and learning process, and if disruptive behaviour prevails, curriculum change cannot be successful. The large number of learners, the noise level is inevitably high which adds to the stress teachers may experience.

4.4.5.1.5. Feedback on assessment

Three of the participants interviewed indicated that an increase in the number of learners which led to an increase in their workload. They indicated that:

SIT1:" In overcrowding classes there were more scripts of test, exercises and examination to mark, it meant that sometimes setting tasks which did not cover all aspects which were expected by mathematics curriculum changes, but by then they are compromising the quality of work the supposed to do in class to avoid too much work to mark".

S2T3: "It was difficult to mark more than fifty learner's books in one day which means it delays the feedback to learners on time which also led to ineffectiveness to implement curriculum change".

S1T3 : “It is difficult to give feedback for each and every learner in overcrowding class, therefore it lead teachers to make learners to exchange books to mark one another’s work to reduce burden for them”.

Teachers spent as much time as one third of their time in assessment related activities and there were indicators that this workload is not decreasing (Lamprianou and Athanasius, 2009)

The findings of the study revealed that teachers teaching overcrowding class have too much homework to mark. It becomes impossible to give effective feedback for everyone. Therefore, teachers engage learners in peer feedback, in other words getting learners to mark one another’s work to reduce marking burden for them. It could be concluded that with an increase of workload and large numbers, mathematics teachers might have ended up in compromising on the quality of assessments which lead to poor implementation of curriculum changes.

4.4.6. Theme 5: Foreseeable success and failures of mathematics curriculum change

Participants make it clear that it would be of great success if curriculum developers make use of the process of issuing teacher learner support materials before the implementation of the new curriculum commences. It was further stated that teacher’s abilities must be updated by provision of training that is up to date with the curriculum changes which alleviated the problem of teaches not knowing what to do in order to implement the new curriculum effectively. Reasons stated were fundamentally based on the teachers receiving once off training.

The following themes emerged from the participant’s responses: Inadequacy of training, lack of resources and financial constraints.

4.4.6.1. Inadequacy of training

I asked the participants whether they had received any training relating to the implementation of mathematics curriculum. Participant's views showed that they had only received teachers training packs which a document was containing a handful of activities that were expected of the teachers to complete in order to assist them in the successful implementation of the new curriculum. The workshops were conducted in the following manner, two workshops a year prior to integration into the foundation phase, furthermore, one workshop held in the year of implementation and finally one year after the year of initial implementation. A number of participants claimed that the training was not suitable for practical use, but rather just a discussion of the policy documents. Two of the participants indicated that:

S1T2: "The training was not enough, the facilitators discussed the policy document without the practicality of it, and how could we able to do it in our mathematics classrooms".

S2H2:" We were not well trained, the curriculum advisors only provided us with teacher training packs as comprehensive document because I do not know how to unpack it order to implement new curriculum may be training should be always once per term because the training we receive is not enough".

Inadequate training complicated teachers to what it was expected from them (Badugela,

2012). Teachers needed more training in order to be equipped with more skills to provide teachers with reality of the classroom (Fullan, 2012). According to Kirkgoz (2013) teachers needed a continuous training program in order for them to get sound knowledge of the curriculum. According to Fullan (2013), one short workshop was not effective for the implementation of the curriculum Mdutshane (2006) further added that due to inappropriate training of teachers, they needed to be confident to form clusters

so that they could share ideas and experiences regarding curriculum implementation, by reviewing their styles of teaching.

Although all of the participants chosen, had received training for the implementation of mathematics curriculum, they indicated that the training they received was not enough. Participants wanted more clarity on the content of mathematics curriculum but curriculum advisors had only enough provided an overview of curriculum changes and showed participants how to use policy documents. The participants were of the opinion that training should be held more frequently, possibly once per term where they could meet with the subject advisors to discuss critical issues that they encountered in the classrooms. The training of mathematics teachers for curriculum changes had always been considered to be of importance for the successful implementation of Mathematics curriculum.

4.4.6.2. Lack of resources

The researcher asked questions about the availability and unavailability of resources for the implementation of CAPS. Participants stated that the department provided them with policy documents and also supplied them with workbooks for term one to term four. Resources were available but not adequately. However, the workbooks that were provided to them had not been enough, there was a challenge of running around by the school management team searching for workbooks from neighbouring schools where enrolment drops, it was really time consuming because we could even buy them in the bookshops which really frustrates us as teachers.

Two of the participants confirmed that:

S2P2:" The DBE supplied policy documents and workbooks on time whereas there was still shortage of workbooks in our school and it is hard to obtain the shortages because we could even bought them from the bookshops principal run around

neighbouring school to check whether there are surplus or not in order to address our shortage this was time consuming”.

S1H1: “Shortage of workbooks and stationery was a challenge, we ran around addressing shortages without learner support materials you cannot make it for a foundation phase learner, for instance if one learner does not have a workbook you should make sure you make a copy, the department of basic education supply the DBE books with shortages”.

Provision of resources was crucial to learning and functionality of the school (Hewson, Kahle, Scantleyburg & Davies, 2013). These findings were also supported by the University of Zimbabwe (1995) who indicated that the government must provide, among others, teaching resources in order to create an environment in which implementation could take place. According to Van der Nest (2012), sufficient facilities like classrooms, laboratories and playing fields serve as the main elements in implementing the curriculum successfully. Moore (2011) agreed with Van der Nest that constraints such as workbooks, classroom size and the schools’ conditions had an effect on the efficient implementation of curriculum change. Fullan (2012) highlighted the fact that government agencies were aware of the importance and difficulty of implementation and were allocating resources to clarify standards of practice.

Most of the participants indicated that the inadequacy in learning resources was the main factor affected the success of curriculum changes. Therefore, the shortage of learner teacher support materials hindered the effectiveness of curriculum changes. Participants further argued that it was the responsibility of the Department of Education to ensure that resources were distributed properly because with shortages the schools might experience difficulties in implementing mathematics curriculum. If resource requirements and their use were not planned correctly, this might lead to difficulties in implementing new curriculum.

4.4.6.3. Financial constraints

Participants stated that due to financial constraints in their schools, it was difficult for teachers to get the materials they needed to teach learners. They stated that they belonged to no fee schools where learners were not supposed to pay school fees and the norms and standard (government allocated funds) obtained from the government was not enough to buy learner teacher support materials. Participants stated that they made copies of the workbooks which demanded more funds from the school.

S2P2: "The challenge of financial constraints to purchase learner support materials, the issue of papers and ink, photocopying machine were a challenge in rural schools because they depended on norms and standard".

S1H1: "As a no fee school we are not supposed to let learners to purchase any learner support materials which lead to use photocopy machines were sometimes find it out of order and no money to service the photocopying machine"

Rembe (2005) stated that financial constraints, lack of training and overcrowded classrooms presented a major challenge for the implementation of policies and governments transformative education programmes. Schools need financial support from the government, parent and from NGO in order to implement the new curriculum effectively (Badugela, 2012).

Learners do not have enough learner support materials due to lack of funding. Teachers made a lot of photocopying and summaries on the chalkboard. Resources purchased by the department were not enough to provide all learners. It ended up hindering the effectiveness of curriculum delivery. Shortage of funds hit hard on the under resourced schools and it ended up affecting the effectiveness of curriculum implementation.

4.4.7. Theme 6: Future suggestions planning of new curriculum development in mathematics teaching and learning

Three participants indicated that there must be cluster committee that would help them after workshops to unpack curriculum content coverage, they even mention the issue of circuit subject committees, school based subject committee which could meet after school and check whether they were still on track or not. The government should make sure that they increase number of curriculum advisors in the foundation phase because at the moment one curriculum advisor monitored five circuits. Additionally, they should be a circuit based curriculum advisor if necessary. Participants indicated that curriculum advisors should well be trained so that they could equip teachers with quality knowledge so that they can implement curriculum effectively. They also mentioned the issue of learner support materials that it should be taken seriously by the Department of Education, so that curriculum could be implemented effectively. Two of the participant indicated that the period between the implementation of curriculum changes was too short to implement new curriculum. In future the department should make sure that teachers and school management team received training to get enough skills and knowledge before introducing curriculum changes. One of the participants commented that:

S1P1: “ Mathematics was the subject that demanded learning resources and expert skills, therefore the department should make sure that before introducing a new curriculum, they ensured that the human resource was well trained and the teacher learner support materials were available at all schools, CAPS seems as good curriculum but the challenge was lack of resources”.

S2H1:”The department should appoint curriculum advisors who have expert knowledge in order to be able to monitor curriculum changes effectively, and should be circuit based not monitoring five circuits which means that the department should increase number of curriculum advisors in the foundation phase, for

S2P2:” Now they should be support structures that would help teachers after workshop to unpack the curriculum by detailing what was taught during the workshop the time between changes of curriculum should be prolonged in order to first adapt to the current curriculum ,curriculum should be gradually faced in”.

Hart (2002) also emphasized that it might be imperative to take into consideration the development of teacher’s knowledge to suit the changes in curriculum. Viewed from this perspective, curriculum implementation also further refers to the stage when curriculum itself, as an educational program was to implemented effectiveness in an attempt of trying to support the previous view, Ngara, Ngwarai and Ngara (2013) claimed that putting the curriculum into operation required solely on implementing agent. Stenhouse (2015) identified the teacher as the agent in the implementation process. He further argued that the implementation was the manner in which the teacher selected and mixed the various aspects of knowledge contained in a curriculum document. For instance, implementation then actually took place when the teacher constructed syllabuses, the teacher’s personality, the teaching materials and the teaching environment interact with the learners (Davis, 2011).

Participant’s suggestion for future planning was mainly based on the support provision of learning resources in Mathematics. They also mentioned the short space of time between curriculum development and implementation. The main setback was resource constraints which hindered the effectiveness of mathematics curriculum .They were also critised for the issue of training and evaluation of teachers which was led by shortage of curriculum advisors and also that they did not have enough capacity to train teachers to implement new curriculum. They also indicated that although it seemed to be coming with some correct measures that could improve the effectiveness of Mathematics curriculum, the main problem they encountered is lack of resources like, classes, Mathematical games, which appeared as history repeated itself. They suggest that government must supply resources in order to implement curriculum effectively.

4.5. SUMMARY

This chapter had presented data collected from the total of ten (10) participants sampled for the study. Therefore, the participants were thus composed of six Mathematics teachers, two heads of departments and two principals sampled from two primary schools under Sibasa Circuit.

For the sake of this study, the collected data were interpreted and analysed in accordance with the six interrelated themes. The following were the major findings that emerged from the analysis of the themes: The teachers as curriculum implementers', needed to be supported in this role. This support could take place in the form of, training workshops, involving them in decision making, provide them with learner support materials, monitoring and evaluation of curriculum change needs to be ongoing. The following chapter would present the summary, findings and recommendations.

CHAPTER 5

SUMMARY, FINDINGS AND RECOMMENDATIONS

5.1. INTRODUCTION

The previous chapter I presented the results of the data collected during interview with principals, heads of department and teachers respectively. In this chapter I present a brief overview of the field of the study, followed by research questions. Recommendations are made under each theme as discussed in chapter four. The limitations and significance of the study are then presented. Finally this chapter presents some conclusions. `

5.2. OVERVIEW OF THE STUDY

The main aim of the study was to investigate the effects of curriculum changes in Mathematics teaching and learning in the foundation in the Sibasa circuit, in Limpopo province. Two schools found in Sibasa circuit were selected through the use of the purposeful-sampled method. This was done with the aim of obtaining the relevant participants who had experience which could indeed assist in acquiring the valuable findings. The use of such a sampling has, in reality, helped so that the researcher might collect data in accordance with the intended purpose or aim of the study as well as giving the correct answers during the interviews with the aim of achieving the study objectives.

Furthermore, this study also sought approaches which could be using when teaching and learning Mathematics especially in the foundation phase, and also perceptions of teacher's beliefs towards curriculum changes. Besides this, the study also sought to examine or explore the effects of curriculum change towards teacher development

including the effects of financial constraints towards curriculum implementation. The other important aspect that was seriously considered in this study pertained to the learner-teacher support materials. The reason behind this was that the possession of adequate learner-teacher materials would, in one way or another, enabled the findings to assist on how the curriculum change might be well implemented.

As also mentioned at the beginning of this paragraph, interviews had provided data from the two sampled schools' participants clearly. In addition to this, purposive sampling was used with the aim of selecting the participants in a qualitative manner hence a qualitative approach had been selecting for data collection purposes, the Face to face interviews was chosen because they often offer the participants an opportunity to answer the posed questions in whatever way they might think of or also involving themselves to respond giving their own views.

In this case, the study was mainly based the effects of curriculum change on teaching and learning of Mathematics in the foundation phase in schools found in Sibasa circuit, within Vhembe district in Limpopo province, and only those participants whose experiences could assist were used. This selection had enabled the researcher to collect data in a simpler manner. Apart from teachers and principals who were selected as participants, heads of department as they often work with teachers, played a pivotal role in making the finding of this study more valid and reliable. As already been mentioned, only two schools were selected so that data could be obtained from them due to the factor.

This chapter therefore presented a summary of the findings developing from data collected from the 10 participants comprising of teachers, principals and heads of department selected purposively from the two schools found in Sibasa circuit, Vhembe district of the Limpopo province.

5.2.1. Demographic information

Two primary schools at Sibasa Circuit was selected purposefully from twenty primary schools. The population of this study was consist of foundation phase teachers, heads of department and principals from Sibasa Circuit. Thus the total of ten participants participated in the study. The sample had more females than male participants.

The participants had teaching experience from sixteen years to fourty two years. This means that in the sample there are teachers who were teaching even before 1994. Most of the teachers experienced curriculum changes from OBE to CAPS. Most participants were trained in the old system, so their knowledge of curriculum 2005 up to CAPS are limited. These teachers might find it difficult to implement curriculum because their perceptions, values and beliefs were formed by curriculum before 1994.

The participants had different qualifications that included Senior Teachers Diploma, Junior Primary teachers Certificate, Bachelor of education and master's degree. The total number of participants with JPTD were four, with BED were three, with MED is one and STD were two. Most of the participants still holding JPTD were females. Principal of school two is the only one holding master's degree. The interviews provided the researcher with rich information regarding the effects of curriculum changes in Mathematics teaching and learning in the foundation phase. The interview were tape recorded and transcribed. The data from the interview were analysed using thematic content analysis.

For ethical reasons, the participants received full information about the purpose and objectives of the study. They were informed that they were free to withdraw from the study at any time, and their information was treated with the outmost confidentiality and anonymity. The participant's names did not appear in the report of this study.

5.2.2. How the study responded to the research questions

The study was informed by the following main research question: What are the effects of curriculum changes on Mathematics teaching and learning in foundation phase in Sibasa Circuit? The following subsidiary questions were raised:

1. What is the effect of curriculum changes on the teaching and learning of Mathematics in the foundation phase at Sibasa Circuit?
- 2 .To what extent do curricula changes affect Mathematics teaching and learning in the foundation phase?

Research question 1: What is the effects of curriculum changes in Mathematics teaching and learning in the foundation phase?

. The study revealed that there is lack of involvement of teachers. Teachers were not consulted in decision making process of Mathematics curriculum changes which led to poor implementation of curriculum changes.

The study indicated most administrative tasks affected teacher's effectiveness, because they reduce teaching time which led to poor implementation of Mathematics curriculum changes. Teachers indicated that since the beginning of the curriculum changes there were many approaches that had been introduced to teaching and learning of Mathematics, they end up teaching with the old method that suits the learners at that time. In research findings the participant indicated that they did not see any reason for them to change the way they teach. The study also found out that there are other teachers who resist changing their method of teaching to new methods of teaching which is very difficult for those who are willing to support the effectiveness of new changes in teaching and learning Mathematics. Some participants indicated that

they do not have understanding of the new approaches that is why they cannot even notice that what they are doing is in line with the new method or not.

During the interview it was discovered that there are some teachers who did not have understanding of the changes, but they seemed to have difficulties in translating theory into practice owing to lack of adequate equipment. Participants seem to be worried about the learning resources which seems like the main issue that is affecting them not to be able to implement curriculum effectively. All materials related regarding curriculum implementation should be supplied to schools by the department of education. It is emerged that the provision of learner support materials needs to be strengthened, and beefed up in order to improve the implementation of Mathematics curriculum.

The research also found out that teachers in order to successfully implement the mathematics curriculum change. Some participants indicated that changes is good but it should be gradually faced in because change is a phenomenon that affects all aspect of person's life and brings about alterations in both personal and employment spheres.

Findings of the study also revealed that there was an over crowdedness in the Mathematics classrooms, they indicated that the class size are overcrowded to an extent that most of the learners find it difficult to pay attention to mathematics concepts that are taught and this affects the effectiveness of curriculum changes in mathematics classrooms especially in CAPS where it direct teachers what to do every day. This led not to complete mathematics pace setters in time. The overcrowded classes also caused disciplinary problems and also led to an increase of teacher's workload on the issue of marking learner's assessment task. Infrastructure needs to be improved in order to determine in order to overcome overcrowded classrooms in order to improve effective implementation of curriculum change

The Mathematics teachers felt that if they should have been extra classes so that they could unpack all the contents supposed to be covered on daily basis. Effective curriculum implementation can be achieved through allocating enough time to

mathematics subjects at schools and creating an atmosphere conducive for teaching and learning.

Most of the participants stated that due to financial constraints, it was difficult to get materials they need to teach learners. This led to unsuccessful implementation of curriculum change.

Teachers seem to be having some difficulties in implementing new curriculum because of inadequate learning resource, many approaches, not well prepared for new changes, high teacher learner ratio, overcrowding classes, time on content coverage and schools' financial constraints that can make the effectiveness of new changes a success in schools in Sibasa Circuit.

Research question 2: To what extend do curricula changes affect Mathematics teaching and learning in the foundation phase?

The findings of the study discovered that it is not easy for the curriculum advisors to give support required because one curriculum monitor five circuit which is difficult to implement. As a results it leaves classroom activities with no one to monitor on how effective the new changes in curriculum are being implemented.

Proper training of teachers, ongoing support from the department of education and the provision of resources could be employed to ensure a smooth implementation of Mathematics curriculum. Teachers need to be thoroughly trained and assisted by curriculum advisors in order to achieve the objectives of curriculum changes. Indeed, the training can be done through regular meetings.

Parents are expected to work actively with teachers in the education of their children in order to achieve curriculum objectives. Because of what the results of the study

have shown, curriculum change in South Africa is a dynamic and constantly challenging task that needs to be taken seriously by all stakeholders.

According to the responses from the participants, it is clear that inadequate provision of human resource and lack of knowledge by the management team hinders effective implementation of curriculum change.

5.3. THE MAIN FINDINGS OF THE STUDY

This study, explored the effects of curriculum change in teaching and learning Mathematics in the foundation phase in Sibasa Circuit. A number of the most important issues pertaining to how the effects of curriculum change on teaching and learning Mathematics in the foundation phase, which include teacher-learning support materials and the involvement of parents in their educational had also been made. Below, are the major findings that emerged, these emanated from the interviews conducted with the sampled participants as displayed in the previous chapter through the selected themes? The main findings of this study were as follows:

- Policy-makers did not provide guidelines on how curriculum should be implemented, and even curriculum advisors were not sent to schools in order to ensure that it is being correctly implemented.
- The issue of the overcrowded mathematics classes was not considered hence it was still staying at 40:1 (teacher-learner ratio) in the foundation phase classes. On the contrary, the Department of Basic Education failed to employ more Mathematics teachers after building more classrooms.
- The policy-makers failed to involve different stakeholders before introducing the new curriculum specifically teachers hence they are the obviously-implementers of any introduced curriculum.

- The department also did not regularly convene workshops, seminars, conferences or even continued trainings for mathematics teachers. These trainings should have been conducted early in the beginning of the year, and not during the third terms. At the late term of the year, it would then serve no purpose of assisting either learners or teachers.
- Parents were also not involved during the introduction of the new curriculum in Mathematics hence they had an important role towards assisting learners in order to perform well.
- Failure on the part of the department was to introduce so many curriculum before the CAPS. It seems if CAPS was the first one to be introduced, it would have become the right one for Mathematics teaching and learning.

5.4. CONCLUSION

In conclusion, the objectives of the study were met and all research questions answered; the participant's responded to the best of their ability on their experiences regarding the effects of curriculum changes on Mathematics teaching and learning in the foundation phase. Based on the results of the study I can conclude that curriculum changes indeed has a great negative effects on Mathematics teaching and learning in the foundation phase.

5.5. LIMITATIONS OF THE STUDY

There was a limitation with respect to the schools used in this study. This study was conducted in two primary schools found in rural areas in the province of Limpopo. These school may have had unique features which may not be present in other schools, district and provinces and therefore these findings reflect effects of curriculum changes in a particular area.

As a result, these findings cannot be generalised to other contexts as teaching contexts can differ. However, the aim of this study is not to generalise the findings, but to get rich, in depth understanding of effects of curriculum changes in Mathematics teaching and learning, within this context.

This study was carried out on a small scale with mathematics teachers, heads of department and school principals who have been in the profession since 1994. In this study only three Mathematics teachers, one head of department and one principal from each of the schools were used as participants.

5.6. RECOMMENDATIONS OF THE STUDY

- Policy makers should provide guidelines on how to implement policies at schools, and they should make a follow up at the school to observe whether curriculum was being implemented successfully
- Mathematics teachers complained about overcrowding classes'. The government should reduce the teacher learner ratio from 40:1 to 30:1 in the foundation phase classes. Therefore, department of education should employ more Mathematics teachers and build more classrooms to alleviate this challenge.
- Policy makers should involve different stake holders before introducing new curriculum, especially teachers because they are the ones who are going to implement it in practice.
- The department should make sure that they should be ongoing training workshops for teachers, and those training should be done early in the beginning of the year not during the third term
- Parental involvement is required where parents need to work hand in hand with teachers in order to improve the learner's progress.

- There should be no curriculum changes for the next ten years until CAPS becomes meaningful engaged, it can be revised but not changing.
- An evaluation plan should be put in place by the curriculum advisors and curriculum designers.
- School management team should be trained in order to provide monitoring and evaluation of curriculum implementation.
- In the future there must be circuit based curriculum advisor not one curriculum advisor per five circuits in order to give maximum support on the implementation of Mathematics curriculum changes.
- Schools and parents should work together for effective implementation of curriculum changes.
- Full support from curriculum advisors is needed.

5.7. RECOMMEDATIONS FOR FURTHER STUDIES

The study provides opportunities for other investigations to be conducted based on the effects of mathematics curriculum changes. It is also therefore recommended that further studies should in future be conducted on the same topic and with more schools included. Apart from this, such further studies might answer the questions below: what are the effects of curriculum changes on Mathematics teaching and learning in foundation phase?

- How the effects of curriculum changes affect the teaching and learning of Mathematics in the foundation phase

5.8. SUMMARY

This chapter presented a summary of the findings based on the data collected through the use of interviews from the two schools found in Sibasa circuit in Vhembe district, of the Limpopo province. The study findings revealed the policy makers did not provide guidelines on how curriculum should be implemented in schools. Adequate curriculum-advisors were also not provided pertaining to the supervision of whether curriculum was being successfully-implemented. Furthermore, the findings of this study also showed that Mathematics teachers often complained about overcrowding classes and the reducing of the teacher-learner ration so that teaching and learning could be well-applied in the foundation phase classes. Besides this, the study's findings also made recommendations that in future policy-makers should involve all the stakeholders from the educational sphere with the aim of minimising problems which emerge after introducing a one-sided curriculum change in schools.

5.9. CONCLUSION

The study made recommendations that the department must make sure that workshops, seminars and ongoing trainings for mathematics teacher are convened. Such trainings should be done early in the beginning of the year. Parents should also be seriously involved so that learners could work towards encouraging themselves to perform well in Mathematics, specifically in the foundation phase

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ANNEXTURE 1: Interview guide

WHAT IS THE EFFECT OF CURRICULA CHANGES ON MATHEMATICS TEACHING AND LEARNING IN FOUNDATION PHASE IN SIBASA CIRCUIT

The purpose of this interview guide is to gain insight on how curriculum changes effects on the teaching and learning of mathematics in foundation phase in Sibasa Circuit.

DETAILS OF INFORMATION OF PARTICIPANTS

GENDER :

TEACHING EXPERIENCE:

QUALIFICATION :

A.WHAT ARE THE FACTORS THAT AFFECT THE EFFECTIVENESS OF NEW CHANGES IN THE TEACHING AND LEARNING OF MATHEMATICS?

1. Describe how you presently feel about changes in curriculum?
2. Do changes in curriculum affected your ways of teaching and how?
3. What are the factors that you think affect the implementation of new changes in mathematics curriculum?
4. What are the challenges that you face while implementing changes in mathematics teaching and learning?

B. TO WHAT EXTENT DO CURRICULA CHANGES AFFECT MATHEMATICS TEACHING AND LEARNING IN THE FOUNDATION PHASE IN THE SIBASA CIRCUIT?

1. What support if any do you receive from school management team in the implementation of mathematics curriculum change?
2. Do you think heads of department have enough capacity to monitor and support

Changes in mathematics teaching and learning?

3. How often do SMT assess the implementation of mathematics curriculum changes?

4. Did you receive recommendations regarding the implementation of mathematics curriculum changes in your school
5. Are there challenges with implementing them? If yes, how do you solve this
6. Do you think there is a need for curriculum development at this stage in South Africa
7. What are your suggestions for the future planning of mathematics curriculum changes in the foundation phase?

ANNEXTURE 2: List of schools participated in this study

1. Bergvlam Primary School
2. Ratshitanga Primary School

ANNEXTURE 3: Participant informed consent declaration

(Participant)

PROJECT TITLE: EFFECT OF CURRICULUM CHANGES ON MATHEMATICS TEACHING AND LEARNING IN FOUNDATION PHASE IN SIBASA CIRCUIT

NDADZA THIVHONALI AGNES from the Department of Social Sciences, University of Zululand has requested my permission to participate in the above mentioned research project.

The nature and purpose of the research project and of this informed consent declaration have been explained to me in a language that I understand.

I am aware that:

1. The purpose of the research project is to investigate the effect of curriculum changes on mathematics teaching and learning in foundation phase in Sibasa Circuit.
2. The University of Zululand has given ethical clearance to this research project and I have seen/may request to see the clearance certificate
3. By participating in this research project I will be contributing towards provide valuable insights into thinking that will inform the development of a strong sense of number and the role of problems in teaching mathematics in primary schools and also helps the reader to more effectively interpret the curriculum while at the same time be useful for teachers in their teaching and learning situations.
4. I will participate in the project by answering questions during a one to one interview.
5. My participation is entirely voluntary and should I at any stage wish to withdraw from participating further, I may do so without any negative consequences
6. I will not be compensated for participating in the research, but my out-of-pocket expenses will be reimbursed.
7. There may be risks associated with my participation in the project. I am aware that the following risks are associated with my participation: physical discomfort, humiliation and emotional stress.

B. the following steps have been taken to prevent the risks: the participants will be assured of their anonymity and in this regard researcher will assure participants that

their names or identities will not be disclosed. Confidentiality will also be assured by protecting all data gathered and by not making the data available to outsiders. Data will be stored in a locked cabinet and the data will be destroyed after completion of analysis. Electronic data will be stored on a computer requiring password access. The researcher will assure the participants that the participation in this research will not cause them any physical discomfort, humiliation and emotional stress

C. there is a medium chance of risk materialising.

8. The researcher intends publishing the research results in the form of dissertation and journal articles. However, confidentiality and anonymity of records will be maintained and that my name and identity will not be revealed to anyone who has not been involved in the conduct of research.

9. I will not receive feedback/will receive feedback in the form of transcripts regarding the results obtained during the study.

10. Any further questions that I might have concerning the research

, One could be compelled to conclude that even in the foundation mathematics learning,

11. By signing this informed consent declaration I am not waiving any legal claim, rights or remedies.

12. A copy of this informed consent declaration will be given to me, and the original will be kept on record.

I,have read the above information/confirm that the above information has been explained to me in a language that I understand and i am aware of this documents contents. I have asked all questions that i wished to ask and these have been answered to my satisfaction. I fully understand what is expected of me during the research.

I have not been pressured in any way and I voluntarily agree to participate in the above mentioned project

Participant's signature

ANNEXTURE 4: Request for permission to conduct research

UNIVERSITY OF ZULULAND
KWADLANGEZWA CAMPUS
PRIVATE BAG X1001
KWADLANGEZWA
3886

THE DISTRICT SENIOR MANAGER
DEPARTMENT OF EDUCATION
P/BAG X2250
THOHOYANDOU
0950



REQUEST FOR THE PERMISSION TO CONDUCT RESEARCH IN SCHOOLS

My name is Ndadza Thivhonal Agnes student no.201759996, and I am student at the University of Zululand, currently doing a master's degree in education specialising in mathematics.

The research I wish to conduct for my master's dissertation involves "The impact of curriculum change in the teaching and learning of mathematics in foundation phase in Sibasa Circuit". The research main objective is to investigate how changes in curriculum are affecting teaching and learning of mathematics in Sibasa Circuit. The research could improve the effectiveness of change in curriculum in teaching and learning of mathematics subject. It will also investigate the factors that might be affecting the effectiveness of changes in mathematics curriculum. The duration of research will take plus or minus six weeks. People expected to participate in the research are the foundation phase teachers, mathematics curriculum advisors and principals who will answer interview questions. Confidentiality and anonymity of information is guaranteed. Participants have got the right not to participate or withdraw. All the information gathered during the process will be dealt with as highly confidential as possible. The researcher would ask to conduct a research at the following Schools: Ratshitanga Primary School, Dzingahe Primary School, Makwarela primary and Bergvlam Primary School at Sibasa circuit. The research is under supervision of Prof.Kutame A.P.

I hereby seek your consent to conduct a research in primary schools mentioned above, under the jurisdiction of Sibasa Circuit and curriculum advisors responsible for mathematics subject. The school will be selected using purposive sampling. The schools are known to the researcher as schools that are the feeder zone of Maths and Science Secondary Schools. The researcher will use interview questions for teachers, curriculum advisors and principals. Activities will not disturb the teaching and learning activities.



Upon completion of study, I understand to provide the Department of Education with a bound copy of the full research report. If you require any further information, please do not hesitate to contact me @0736408905

Yours faithfully

Ndadza T.A

14/08/2017

ANNEXURE 5: Permission to conduct research

	LIMPOPO PROVINCIAL GOVERNMENT REPUBLIC OF SOUTH AFRICA				
DEPARTMENT OF EDUCATION VHEMBE DISTRICT					
CONFIDENTIAL					
<table border="1" style="width: 100%;"><tr><td>DEPARTMENT OF EDUCATION VHEMBE DISTRICT</td></tr><tr><td style="text-align: right;">2017-08-28</td></tr><tr><td>PRIVATE BAG X 2250 SIBASA 0 TEL: 015 962 1313/4 FAX: 015 962 1313/4</td></tr><tr><td style="text-align: right;">LIMPOPO PROVINCE</td></tr></table>		DEPARTMENT OF EDUCATION VHEMBE DISTRICT	2017-08-28	PRIVATE BAG X 2250 SIBASA 0 TEL: 015 962 1313/4 FAX: 015 962 1313/4	LIMPOPO PROVINCE
DEPARTMENT OF EDUCATION VHEMBE DISTRICT					
2017-08-28					
PRIVATE BAG X 2250 SIBASA 0 TEL: 015 962 1313/4 FAX: 015 962 1313/4					
LIMPOPO PROVINCE					
<p>REF: 14/7/R ENG: MATIBE M.S TEL: 015 962 1029</p> <p>NDADZA T.A UNIVERSITY OF ZULULAND KWADLANGEZWA CAMPUS PRIVATE BAG X 1001 KWADLANGEZWA 3886</p> <p>PERMISSION TO CONDUCT RESEARCH AT SCHOOLS</p> <ol style="list-style-type: none">1. The above matter refers.2. You are hereby informed that your request for permission to conduct research on <i>"The impact of curriculum change in the teaching and learning of mathematics in foundation phase in sibasa circuit."</i> has been granted.3. You are expected to adhere to research ethical considerations, particularly those relating to confidentiality, anonymity and informed consent of your research subjects.4. Kindly inform circuit managers and School Principals of selected schools prior to commencing your data collection.5. Wishing you the best in your study. <div style="display: flex; justify-content: space-between;"><div style="width: 45%;"><p> DISTRICT DIRECTOR</p></div><div style="width: 45%; text-align: right;"><p>2017-08-28 DATE</p></div></div> <p>PERMISSION TO CONDUCT RESEARCH AT SCHOOLS: NDADZA T.A</p> <p style="font-size: small;">Thohoyandou Government Building, Old Parliament, Block D, Private Bag X2250, SIBASA, 0970 Tel: (015) 962 1313 or (015) 962 1331, Fax: (015) 962 6039 or (015) 962 2288</p> <div style="background-color: #cccccc; padding: 5px; text-align: center;"><p>The heartland of southern Africa - development is about people!</p></div>					

ANNEXURE 6: Ethical clearance

**UNIVERSITY OF ZULULAND
RESEARCH ETHICS COMMITTEE**
(Reg No: UZREC 171110-030)



RESEARCH & INNOVATION

Website: <http://www.unizulu.ac.za>
Private Bag X1001
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Tel: 035 902 6731
Fax: 035 902 6222
Email: DlaminiA@unizulu.ac.za

ETHICAL CLEARANCE CERTIFICATE

ETHICAL CLEARANCE CERTIFICATE				
Certificate Number	UZREC 171110-030 PGM 2018/496			
Project Title	EFFECTS OF CURRICULUM CHANGES ON MATHEMATICS TEACHING AND LEARNING IN FOUNDATION PHASE IN SIBASA CIRCUIT			
Principal Researcher/ Investigator	TA Ndadza			
Supervisor and Co-supervisor	Prof AP Kutame		Mr Talase T	
Department	Social Science			
Faculty	Education			
Type of Risk	Med risk: Data collection from people			
Nature of Project	Honours/4 th Year		Master's x	Doctoral
				Departmental

The University of Zululand's Research Ethics Committee (UZREC) hereby gives ethical approval in respect of the undertakings contained in the above-mentioned project. The Researcher may therefore commence with data collection as from the date of this Certificate, using the certificate number indicated above.

- Special conditions:
- (1) This certificate is valid for 2 years from the date of issue.
 - (2) Principal researcher must provide an annual report to the UZREC in the prescribed format [due date- 28 May 2019]
 - (3) Principal researcher must submit a report at the end of project in respect of ethical compliance.
 - (4) The UZREC must be informed immediately of any material change in the conditions or undertakings mentioned in the documents that were presented to the meeting.

The UZREC wishes the researcher well in conducting research.



Professor Gideon De Wet
Chairperson: University Research Ethics Committee
Deputy Vice-Chancellor: Research & Innovation
28 May 2018

CHAIRPERSON
UNIVERSITY OF ZULULAND RESEARCH
ETHICS COMMITTEE (UZREC)
REG NO: UZREC 171110-30

28-05-2018

RESEARCH & INNOVATION OFFICE

ANNEXTURE 7: Editing certificate

<p>23 Elfin Glen Road, Nahoon Valley Heights, East London, 5200</p> <hr/> <p>Professional EDITORS Group</p> <p>To whom it may concern:</p> <p>This document certifies that the dissertation whose title appears below has been preliminary edited for proper English language, grammar, punctuation, spelling and overall style by Rose Masha, a member of the Professional Editors' Group whose qualifications are listed in the footer of this certificate.</p> <p>Title:</p> <p>EFFECTS OF CURRICULUM CHANGES ON MATHEMATICS TEACHING AND LEARNING IN FOUNDATION PHASE IN SIBASA CIRCUIT</p> <p>Author:</p> <p>NDADZA THIVHONALI AGNES</p> <p>Date Edited:</p> <p>21 January 2019</p> <p>Signed</p> <p></p> <p>Dr. Rose Masha</p> <p>B. Library & Inf. Sc.; HDE; Hons. ELT; M. Phil. Hyll.; PhD Ed.</p>
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