

**TEACHING OF GEOGRAPHY MAPWORK IN GRADE 12: A CASE OF NZHELELE
WEST CIRCUIT IN VHEMBE DISTRICT**

by

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DECLARATION

I, **ANANIAS MUKONDELELI**, declare that:

TEACHING OF GEOGRAPHY MAPWORK IN GRADE 12: A CASE OF NZHELELE WEST CIRCUIT IN VHEMBE DISTRICT

... is my own work and has not been previously submitted in any form whatsoever, by myself or anyone else, to this university or any other educational institution for any degree or examination purposes. All resources that I have used or quoted have been indicated and duly acknowledged by means of complete references.

.....
ANANIAS MUKONDELELI

.....
DATE

DEDICATION

This dissertation is dedicated to my mother, Mrs Mashau Mukondeleli, and my father, Mr Petrus Mukondeleli, who raised and nurtured me and also laid down the foundation for my studies. My wife, Vissah Sewela Mukondeleli, my daughters, Mpho Selokela Mukondeleli, Mukhethwa Mashau Mukondeleli and Rialivhuwa Tsiko Mukondeleli, for their encouragement and support during my studies. Above all, God Almighty who gave me strength and zeal to travel thus far.

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ABSTRACT

The purpose of this study was to investigate the challenges prevalent in teaching mapwork in Geography at Grade 12. The researcher adopted the mixed-methods research design which, combines elements of the qualitative and quantitative approaches. The researcher used an interview schedule and questionnaires to collect data. Purposive sampling and simple random sampling were used to select participants for the study. The population comprised of Heads of Departments of Geography, Geography teachers and Grade 12 learners. The Qualitative sample consisted of 5 Heads of Departments of Geography and 5 Geography teachers. The Questionnaires were administered on 150 learners. The researcher analysed the qualitative data thematically. The Quantitative data was analysed through the Statistical Package for Social Sciences (SPSS) version 25. The findings showed that the dearth of learner-teacher support materials and overcrowded classrooms are the major set back on teaching Geography mapwork at Grade 12. The study recommended that the Department of Basic Education should provide schools with enough learner-support materials and construct enough classrooms at schools, so that there is a conducive teaching-learning environment.

Keywords: Constructivism, Geography, learning, Mapwork, teaching.

LIST OF ACRONYMS

ANC	:	African National Congress
BOED	:	Boards of Education and Discipline
CAPS	:	Curriculum and Assessment Policy Statement
COPE	:	Congress of the People
DBE	:	Department of Basic Education
DoE	:	Department of Education
FET	:	Further Education and Training
GIS	:	Geographic Information System
GPS	:	Geographic Positioning Systems
HSRC	:	Human Sciences Research Council
LoLT	:	Language of Learning and Teaching
LTSM	:	Learner Teacher Support Materials
MONE	:	Ministry of National Education
NCS	:	National Curriculum Statement
NCOP	:	National Council of Provinces
NERDC	:	Nigerian Educational Research and Development Council
NSC	:	National Senior Certificate
OBE	:	Outcomes-Based Education
PGCE	:	Postgraduate Certificate in Education
REQV	:	Relative Education Qualification Value
RNCS	:	Revised National Curriculum Statement
SAQA	:	South African Qualification Authority
SPSS	:	Statistical Package for Social Sciences
SSSCE	:	Senior Secondary School Certificate Examination
STAD	:	Student-Teams-Achievement Divisions
TGT	:	Teams-Games-Teams
UBE	:	Universal Basic Education
WAEC	:	West African Examinations Council
WEF	:	World Economic Forum

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CHAPTER 1

INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 INTRODUCTION

This chapter consists of the background of the study, statement of the problem, purpose of the study, followed by research questions, definition of key words and research design and methodology. The chapter further discusses the significance of the study, delimitation of the study, outline of the study and then ends with conclusion.

1.2 BACKGROUND TO THE STUDY

One of the indispensable areas in the teaching of Geography curriculum is mapwork. Geography is where teachers teach mapwork and in so doing encounter challenges. The responsibility of teaching mapwork rests firmly with the Geography teachers. The teaching of mapwork and learning thereof are intricately linked (Ababio, 2013:26). However, the challenges to teaching mapwork in Grade 12 are still worrisome, as shown by the National Senior Certificate (NSC) Examination Diagnostic Reports for Geography (2015:98), for the past four years. According to NSC Examination Diagnostic Report for Geography (2015:100), learners continue to struggle with calculations and cannot calculate the area on the orthophoto map accurately.

In spite of the importance of Geography mapwork in South Africa, the analysis done and shown in the NSC Examination Diagnostic Report for Geography (2011:62) reflects a noted drop in the performance of learners in the Geography mapwork aspects. The above assertion is reflected clearly in the continuous decline in the regular marks per question, articulated as a percentage in mapwork from 2012 to 2015 as shown in Table 1.1

Table 1.1: Average Percentage Performance per Question from 2012- 2015

Question No.	Type of Question	Maximum	Average %	Average %	Average %	Average %
			2012	2013	2014	2015
1	Multiple-choice questions	20	69.5	61.4	55	51
2	Calculations and application	20	40.8	48.5	57	49
3	Application and interpretation	40	41.6	46.3	44	48
4	Geographic Information Systems	20	45.6	30.9	39	44

Adapted from: NSC Examination Diagnostic Report for Geography, DBE, 2015:98

The NSC Examination Diagnostic Report for Geography (2013:89) justified the continuous decline in Geography mapwork in Grade 12 by saying, “second and third language candidates are unable to express themselves in English, lack of content knowledge, including not understanding basic mapwork concepts, lack of fundamental knowledge of mapwork, fundamental knowledge of calculations and knowledge of GIS are still lacking”.

Adeyemi (2014:22) asserts that learners find mapwork very difficult and thus achieve poorly in Geography as a whole. Related literature indicates that learners’ challenges in mapwork are linked to psychological development and there is little mention of the relevance of teachers’ competence and teaching-learning resources for the teaching of mapwork. This is the gap the study aims to fill at the completion of the research (Onserio, 2008:69). The researchers’ envisaged gap to be clogged is the incompetency of learners due to challenges of learner-teacher support materials.

From the present researcher’s experience as the Head of Department of Geography since 2010, school-related factors, learner-related factors and teacher-related factors impede good performance in mapwork. Declining learner performance in Geography as a result of poor mapwork teaching motivated the undertaking of this study.

1.3 STATEMENT OF THE PROBLEM

Poor performance of learners in Geography mapwork has been a challenge to Geography teachers (Onserio, 2008:60). The National Senior Certificate Examiners' Diagnostic Report for Geography provide noble evidences for those realities (DBE, 2011:62). The importance of mapwork in Geography Curriculum cannot be overemphasised. Despite this, in South Africa, learners' performance in Geography mapwork is poor and has not shown any sign of improvement. It was based on these facts that this research identified mapwork as a challenge in learners' performance has constantly been low. Onserio (2008:65), Beyene (2014:20), Omoro and Nato (2014:229), opined that, some poor teaching methods which are teacher-centred are a major cause of the low achievement in mapwork as they are outdated. It is because of this background that the study investigated challenges that are prevalent in the teaching of mapwork in Geography in Grade 12.

1.4 PURPOSE OF THE STUDY

The purpose of this study was to investigate the challenges prevalent in the teaching of mapwork in Geography at Grade 12.

To achieve this purpose, the following objectives were developed:

- To investigate challenges learners experience when they study mapwork.
- To investigate challenges teachers experience when they teach Geography mapwork.
- To investigate teaching strategies that can be adapted to teach mapwork in Geography.

1.5 RESEARCH QUESTIONS

The main research question is: What are the challenges that teachers of Geography experience in teaching Geography?

In order to answer this question, the following subsidiary questions were developed:

- What are the challenges that learners experience when studying Geography ?
- What are the challenges teachers experience when they teach Geography mapwork ?
- What are the teaching strategies that can be adapted to teach mapwork in Geography?

1.6 THEORETICAL FRAMEWORK OF THE STUDY

This study is underpinned by Social Constructivism as developed by post-revolutionary Soviet psychologist, Lev Vygotsky. Social Constructivism is a theory of knowledge in sociology and communication theory that examines the knowledge and understandings of the world that are developed jointly by individuals (Amineh & Asl, 2015:13). Social Constructivism involves interaction between learners, teachers and the community. Vygotsky's philosophy accentuated learner-centred and discovery-oriented progressions (Liu & Matthews, 2005:388). This theory is a learner-centred approach adopted by the Department of Basic Education in South Africa as a model of Outcomes-Based Education (OBE) (Maduane, 2016:10). Vygotsky believed that learning is the process by which learners are integrated into a knowledge community. Learners are believed to be acculturated into their learning community and appropriate knowledge, based on their interaction with the immediate learning environment (Motitswe, 2011:46).

A central concept in Vygotsky's theoretical system is the role of social collectivity in individual learning and development (Liu & Matthew, 2005:393). Social constructivism encourages cooperative and collaborative learning styles, where there is collective participation of learners. Teachers place learners in small, mixed ability groups which encourage mutual interdependence and yet provide for individual accountability.

In a school, Vygotsky underlines that three elements are always active: the environment, the student and the teacher (Liu & Matthews, 2005:399). Social

constructivism also believes that knowledge is co-constructed in a social environment and that in the process of social interaction; people use language as a tool to construct meaning (Churcher, Downs & Tewksbury, 2014:34). The use of language between individuals in an environment as an inter-psychological tool is central to social constructivist thought on the learning process. According to Churcher *et al.* (2014:34), this framework can be ware housed in remembrance and used by the learner to make logic of his or her milieu at a later date.

According to Schreiber and Valle (2015:396), Vygotsky's theory accentuates the effect of social and cultural influences on learners, the ways their varied backgrounds and experiences shape, learners' ability to learning, and the way learners understand and interpret concepts. Social Constructivism is based on the belief that learners can be assisted to construct meaningful knowledge that is useful in their own lives. It focuses much on how learners learn rather than what they learn. The skills learners learn are more important than the content learners learn. Social Constructivism also believes that teachers should assess learners on a continuous basis (Jacobs, Vakalisa & Gawe, 2011:42).

The Social Constructivism approach is based on the notion that the learner builds new knowledge from the foundation of the knowledge previously acquired. Learners are to be given the foundation of knowledge by teachers so that they become able to develop themselves academically. In Social Constructivism, new knowledge can be built on the knowledge the learners already have. Social Constructivism is relevant for this study because Grade 12 mapwork needs prior knowledge of map work skills from Grade 10 and 11. This theory holds that every learner constructs his or her ideas as opposed to receiving them from the teacher. Mapwork requires social constructivist teachers using social constructivist style of teaching (Schreiber & Valle, 2015:405).

In the classroom, Social Constructivist teaching involves a change in teaching from a telling-listening relationship to a complex and interactive relationship where the learners' own efforts to understand are the focal point. In this research, learners are also the active participants in the creation of their own knowledge.

This Social Constructivist theory is related to this study as some of the challenges of teaching and learning map work to Grade 12 learners are related to the social and environment where the learners come from and the researcher intended to come up with teaching strategies that can solve these challenges. One of the learning strategies is to use collaborative learning strategy as suggested by Vygotsky's social constructivist theory. According to Vygotsky's theory of social constructivism, in teaching, the teacher's role is to monitor, coach, guide, advise and facilitate learning while encouraging learners to take ownership of the learning process. This on its own, according to Vygotsky, is one of the teaching strategies that can be used to minimise the high failure rate in Grade 12 mapwork (Liu & Matthews, 2005:399).

1.7 DEFINITION OF KEY WORDS

This section defines key words used in this study. This key words are defined so that the readers may share the common understanding of the study .

1.7.1 Constructivism

According to Amineh and Asl (2015:9), constructivism describes the way that the learners can make sense of the material and also how the materials can be taught effectively.

In this study, the teacher used constructivism by considering the learner's knowledge first and allow them to put that knowledge in practice when teaching them mapwork.

1.7.2 Geography

According to the DBE CAPS (2011a:8), Geography is the study of human and physical environments. Geography is a subject that combines topics which are related to the physical and human developments over space and time. Geography is also the mother of all science subjects, as all subjects include a portion of Geography in it. Cohen (2011:5) further asserted that Geography is derived from the Greek word "geo" meaning earth and "graph" meaning to write or describe.

In this study, mapwork were analysed, as it is in the Geography Curriculum where it is studied.

1.7.3 Teaching

Du Plessis, Conley and Du Plessis (2007:2) define teaching as the creation of chances for learning to take place as well as the process of helping learners to learn. Ababio (2013:26) also hold a similar view, that teaching is the process of carrying out undertakings that experience has revealed to be effective in getting learners to learn. From Ababio's view of teaching, one can infer that teaching and learning are intricately linked; hence one cannot separate the one from the other. In this study, teaching means a situation in which the teacher's part is that of facilitator of learning. In this teaching of mapwork, the learners are well expected to participate actively in the learning process.

In this study, teaching is done by a professionally trained person to teach learners to acquire knowledge and skills. The teaching of Grade 12 mapwork is characterized by calculation, drawing, measurement, reading and interpretation of both topographical map and orthophoto maps.

1.7.4 Mapwork

The concept mapwork is a blend of mainly two words, namely, map and work which literally means working with maps. According to Onserio (2008:21), mapwork is the process of interpreting maps. It essentially involves the recognition of symbols used to represent physical and human features shown on topographical maps and the understanding of their spatial relationships and significance. Dlamini (2014:2), also defines mapwork as a theme in Geography that allows learners to understand spatial area in relation to natural land and artificial features such as the development of cities or landforms. In this study the concept of mapwork is important as it is the backbone of the study to be analysed and find out why it is difficult to be learned.

In this study, the concept mapwork involve map codes, directions, grid references, scales, calculating magnetic bearing, calculating gradient, calculating area, drawing of cross-sections and intervisibility.

1.7.4 Learning

Monteith (2008:4) defines learning from a cognitive perspective as a fairly stable change in deeds due to experience. Monteith further outlines learning as a relatively permanent change in mental associations due to experience. According to Ababio (2013:26), learning is the responsibility of the teacher and if learners do not learn it is the fault of the teacher. Generally, learning denotes how learners obtain knowledge, develop new behaviours and adapt to life's challenges.

In this study, knowledge was acquired by learners through practicing calculations, drawings of cross-sections, simulations, presenting and mediating with peers in groups.

1.8 RESEARCH DESIGN AND METHODOLOGY

This section addresses the research design and methodology of the study.

1.8.1 Research Design

Research design is the blue print of the research project that precedes the actual research process (Mouton, 2009:107). In this study, the researcher used mixed-methods research design. According to Creswell (2010:123), mixed-methods design is the type of research design that combines elements of qualitative and quantitative approaches. A mixed-methods design is the type of research in which the researcher combines features of qualitative and quantitative research approaches for the purposes of breadth and depth of understanding and corroboration (Creswell, 2010:123). This section discusses qualitative and quantitative approaches as follows:

1.8.1.1 Qualitative design

The qualitative approach is a form of interpretative inquiry in which researchers make an interpretation of what they see, hear and understand (Creswell, 2009:176). A qualitative approach also emphasises the qualities of entities and meanings that are not experimentally examined in terms of quantity.

1.8.1.2 Quantitative design

The quantitative approach is an design which is used to answer questions about relationships among measured variables with the purpose of explaining, predicting and controlling phenomena (Leedy & Ormrod, 2005:94). This is the type of educational research in which the researcher decides what to study and asks specific narrow questions, collects numeric data from participants and analyse these numbers using statistics.

1.8.2 Research Methodology

Creswell (2009:18) refers to research methodology as the different techniques, methods and procedures that are used in the process of implementing research design. This section discusses both qualitative and quantitative research methods as follows:

1.8.2.1 Qualitative research methods

Qualitative data were collected through an interview schedule. According to Bunting (2006:55), an interview schedule is an established protocol, usually written, detailing the procedures and questions to be asked in a structured interview. The researcher used the interview schedule as the interviewer can probe deeper into a response given by an interviewee and is useful for untangling complex topics.

1.8.2.2 Quantitative research methods

Quantitative data were accessed through questionnaires. Hesse-Biber (2010:102), defines a questionnaire as a written document that has a set of questions given to participants. The researcher opted to use a questionnaire because it best serves the needs of this study as participants answered them according to their experience and opinions.

1.9 SAMPLING

This section involves the selection of population and the determination of the sampling procedures and samples.

1.9.1 Population

A population is a group of people with one or more characters that the researcher is interested in and from which a sample is drawn (Hanslam & McGarty, 2003:213). The population of the study were 5 Heads of the Department of Geography, 5 Geography teachers and 150 Grade 12 Geography learners.

1.9.2 Sampling Procedures

Two sampling procedures were considered for this study, namely; qualitative sampling procedure and quantitative sampling procedure discussed below :

1.9.2.1 Qualitative sampling procedure

In the qualitative approach, purposive sampling was used to select the participants. Purposive sampling refers to the use of researchers' knowledge in order to meet the research goals (Dattalo, 2008:6). The reason for using purposive sampling is that it enables researchers to select a sample based on the purpose of the study and knowledge of the population. Participants are chosen due to the relevant knowledge they have.

1.9.2.2 Quantitative sampling procedure

For the quantitative approach, simple random sampling was used to collect data. Random sampling is a method of selecting a sample from a statistical population in such a way that every possible sample that could be selected has a predetermined probability of being selected by the researcher (Leedy & Ormrod, 2005:201). The researcher used simple random sampling because its sampling represents the target population and eliminate sampling bias.

1.9.3 Sample

According to Neuman (2006:219) a sample is a collection of a small number of units taken from a larger population. Two types of samples were considered for this study, namely qualitative sample and quantitative sample as discussed below:

1.9.3.1 Qualitative sample

Qualitative sample consisted of 5 Heads of the Department of Geography and 5 Geography teachers.

1.9.3.2 Quantitative sample

Quantitative data were collected from 150 learners through questionnaires.

1.10 MEASURES OF QUALITY CONTROL

In this section measures of quality control that used in the study was discussed. Trustworthiness was used for the qualitative approach while validity and reliability were used for the quantitative approach.

1.10.1 Trustworthiness of the Study

Trustworthiness refers to the manner in which data are acknowledged to be true, applicable, consistent and unbiased (Nel, 2010:22). To ensure trustworthiness in the execution of the study, the researcher used triangulation. O'Leary (2004:115), postulated that triangulation is the use of different sources to confirm the authenticity of research findings. It is for this reason that the researcher used mixed-methods to increase the value of the findings.

Trustworthiness is determined through credibility, transferability, dependability and conformability (Bloomberg & Volpe, 2008:85). Each of these aspects are discussed below:

1.10.1.1 Credibility

Credibility refers to the researcher's confidence regarding the findings and whether the data gathered are a true reflection (Ary, Jacobs, Razavieh & Sorensen, 2006:504). To determine credibility, the researcher used triangulation which is the application of different methodologies in answering the same research question. In this case qualitative and quantitative methods were used by the researcher. This is the use of mixed-methods in the study. In this study, credibility was ensured through prolonged engagement in the field, data triangulation and member-checking.

1.10.1.2 Transferability

Transferability refers to the probability that the research findings have meaning when compared with others in similar situations (Ary *et al.*, 2006:507). To ensure transferability, the richness of the descriptions included in the study and the amount of detailed information provided by the researcher were assessed.

1.10.1.3 Dependability

Dependability refers to the probability of producing similar results should the study be replicated (Nel, 2010:24). To determine dependability in the study, data triangulation were used in the form of interviews and questionnaires. This form of triangulation uses different methods of data collection (Buntting, 2006:53). The researcher used interviews and questionnaires to try and come up with the same results.

1.10.1.4 Confirmability

Confirmability indicates the neutrality (unbiased nature) of the research (Ary *et al.*, 2006:511). The main question to be answered to determine confirmability is: How can the researcher's bias best be managed? In this study confirmability were ensured through the following strategies; researcher-participant relationship and triangulation.

1.11 VALIDITY AND RELIABILITY OF THE STUDY

This section considers the validity and reliability of the instruments to be used to measure the questionnaires. In order for the findings to be genuine and of value, the

researcher ensured the highest degree of validity and reliability by using a mixed methods approach.

1.11.1 Validity

Validity refers to the extent to which the research instrument measures what it is intended to measure (Leedy & Ormrod, 2010:28). Bernard (2011:41), asserts that validity refers to the accuracy and trustworthiness in terms of the instrument used for research, the data itself as well as the findings. For instance, the instruments used for collecting data must be appropriate for gathering data for learners that were able to answer the research question and measure a particular concept. The questions asked should therefore, address the objectives of the study. In this study, questions were structured and organised to minimize misunderstanding and eliminate ambiguity.

1.11.2 Reliability

Bernard (2011:42), describes reliability as being related to the possibility of coming to the same answer if a particular instrument is used to measure a specific theory more than once. In other words, to call data and findings reliable, one must get the same answer every time it is measured and tested. Reliability is the consistency with which a research instrument yields a certain result when the entity being measured has not changed. In order to test the effectiveness of a questionnaire as the instrument to be used in quantitative data, a pilot study was conducted to establish whether there is ambiguity in the instruments to be used and yields the type of data expected.

In order to test the validity and reliability of the instruments, the researcher asked the same research questions to all participants at different times in order to maintain consistency and come up with the same answer and findings. In order to increase the reliability of the research, all interviews were conducted in person by the researcher. The researcher also maintained consistency by utilising the same interview structure and interview questions.

1.12 DATA ANALYSIS

According to McMillan and Schumacher (2006:364), data analysis is an ongoing, cyclical process that is integrated into all phases of research. This is the process of bringing order, structure and meaning to the mass of collected data. Qualitative and quantitative data analysis that was used in the study is delineated here under:

1.12.1 Qualitative Data Analysis

Qualitative data was analysed thematically. Thematic analysis is a method for identifying, analysing and reporting patterns (themes) within data (Braun & Clarke, 2006:79). The researcher used it because it is theoretically flexible and capable of detecting and identifying factors and variables that influence any issue generated by the participants.

1.12.2 Quantitative Data Analysis

Quantitative data was analysed through the Statistical Package for Social Sciences (SPSS) version 25. SPSS has a very powerful proprietary command syntax language to quickly perform and administer basic statistical analysis and particularly good with questionnaire data and also produces high quality data (Basturk, 2005:176).

1.13 SIGNIFICANCE OF THE STUDY

The study is important because it has the potential to make several contributions to the Department of Basic Education especially in the field of Curriculum Studies. The findings of this study would provide useful information on the status of learning mapwork as a component of Geography in Vhembe District. More importantly, the following groups of people would benefit from the study: Learners would be exposed to learning strategies that enhanced their performance when studying mapwork in Grade 12. Teachers would be exposed to learner-centred teaching strategies they should use to teach mapwork in Grade 12, Heads of Departments of Geography

would be exposed as well to teaching strategies and used this knowledge to support both learners and teachers in the field of mapwork in Grade 12.

1.14 DELIMITATION OF THE STUDY

This study was carried out in the Nzhelele West Circuit in the Vhembe District in the Limpopo Province (South Africa).

1.15 ETHICAL CONSIDERATIONS

The researcher applied for ethical clearance and approval from the Ethics and the Higher Degrees Committee in order to conform and comply with the university's research ethical codes, guidelines, protocol and correct practices. Permission to conduct the study was sought from the Vhembe District Department of Education. From there, the researcher sent application letters to conduct the study to the sampled schools. Participants of this study remained anonymous. All the participants were treated with respect all the time. Each participant signed a consent form which explained the purpose of the study and their rights to participate and to withdraw without giving any explanation.

1.16 OUTLINE OF THE STUDY

The research study comprised of five chapters outlined as follows:

Chapter 1: Introduction and Background of the Study

This chapter outlines the introduction and background of the study, statement of the problem, purpose of the study, research questions definition of key words, research design and methodology, sampling, measures of quality control, data analysis, significance of the study, delimitations of the study, ethical considerations and outline of the study.

Chapter 2: Literature Review on the Experiences of Teaching Geography Mapwork

This chapter presents theoretical framework and literature review on the experiences of teaching Geography mapwork in Grade 12.

Chapter 3: Research Design and Methodology

This chapter presents the introduction, research design and methodology, measures of quality control, data analysis and ethical considerations.

Chapter 4: Data Analysis and Presentation of the Study

This chapter presents the data analysis and presentations of the study and the results of the study.

Chapter 5: Summary, Limitations, Conclusion, Recommendations and Suggestions for Further Study

This chapter presents, the summary, limitations, conclusion, recommendations as well as the suggestions for further study.

1.17 CONCLUSION

In this chapter, the researcher provided an introduction and background to the study, statement of the problem, its purpose and research questions. The key words were introduced, and all the parameters of the study were also set up, including the research design and research methodology. The next chapter presents literature review on the experiences of teaching Geography mapwork in Grade 12.

CHAPTER 2

LITERATURE REVIEW ON THE EXPERIENCES OF TEACHING GEOGRAPHY MAPWORK

2.1 INTRODUCTION

This chapter provides an in-depth review of the literature on the teaching of Geography mapwork. Prior to the review, a theoretical framework of Social Constructivism in relation to the teaching of Geography mapwork was discussed. The review includes learner challenges in studying Geography mapwork, teachers' challenges in the teaching of Geography mapwork and teaching strategies suitable for teaching Geography mapwork successfully. This chapter also endeavours to outline the teaching of Geography mapwork in developed countries such as Turkey, developing countries such as Nigeria and South Africa. Both Turkey and Nigeria were selected by the researcher because they introduced Curriculum 2005, which is outcome-based during the same period as South Africa.

2.2 THEORETICAL FRAMEWORK: SOCIAL CONSTRUCTIVISM

The current study was informed by Social Constructivism theory of Lev Vygotsky. This was done to prompt an understanding of theories and concepts relevant to the challenges experienced when teaching Geography mapwork.

Social Constructivism involves the interaction between learners, teachers and the community. Vygotsky's philosophy accentuated learner-centred and discovery-oriented progressions (Liu & Matthews, 2005:388). This theory is a learner-centred approach, adopted by the Department of Basic Education in South Africa as a model of Outcomes-Based Education (OBE) (Maduane, 2016:10). Vygotsky believes that learning is the process through which learners are integrated into a knowledge community. Learners are believed to be acculturated into their learning community and appropriate knowledge, based on their contact with the direct learning environment (Motitswe, 2011:43).

A crucial concept to Vygotsky's theoretical classification is the role of social collectivity in individual learning and development (Liu & Matthew, 2005:393). Social Constructivism encourages cooperative and collaboration learning styles, where there is collective participation of learners. For example, learners can work in groups and discuss procedures to calculate the vertical exaggeration of a cross-section if the vertical scale is 1 centimetre represents 20 metres and the horizontal scale is 1:50 000. Using Team-Games-Teams, and the cooperative learning approach, learners are matched in groups of four and play the academic game of mastering all steps to calculate Vertical Exaggeration and compete against each other and are awarded marks by the teacher. Teachers place learners in slight, mixed-ability groups which encourages mutual interdependence and yet offer for individual accountability.

In a school, Vygotsky underlines that three components are always dynamic: the environment, the learners and the teacher (Liu & Matthews, 2005:399). For example, throughout mapwork lessons, learners should be given topographical maps with all the environmental features on them, such as earth features, water features and vegetation features, to analyse and interpret. Learners are able to perform these functions with the help of the teacher. In such a setting, the teacher will be assisting the learner to explore the environment in which he/she lives. Social Constructivism also believes that knowledge is co-constructed in a social environment and that in the process of social interaction, people use language as a means to paradigm undertone (Churcher, Downs & Tewksbur; 2014:34).

Teachers can use simulation of sports in geography mapwork that requires learners to observe various concepts and phenomenon. That is, learners test their own understanding of mapwork against those of their teachers. The usage of language between individuals in an environment as an inter-psychological tool is crucial to social constructivist thought on the learning process. According to Churcher *et al.*, (2014:34), this framework can be warehoused in remembrance and used by the learner to make logic of his or her milieu at a later date.

According to Schreiber and Valle (2015:396), Vygotsky's theory hightens the effect of social and cultural influences on learners, the ways their varied backgrounds and

experiences shape, learners' learning and the way learners understand and deduce concepts. Social Constructivism is based on the conviction that learners should be assisted to build meaningful knowledge that is valuable in their own lives. It focuses much on how learners learn rather than what they learn. The skills learners learn are more important than the content learners learn. In Geography mapwork such skills are not limited to categorising questions and issues, collecting and structuring evidence, processing, interpreting and assessing data, making decisions and judgements, deciding on a point of view, suggesting solutions to problems, working co-operatively and independently and using verbal, quantitative and symbolic data forms, such as text, pictures, graphs, tables, diagrams and maps (DBE, 2011a:9).

Social constructivism also believes that teachers should assess learners on a continuous basis (Jacobs, Vakalisa & Gawe, 2011:42). According to DBE (2011b:50), continuous assessment of Grade 12 Geography 2017 is conducted as follows:

Table 1.2: Continuous Assessment of Grade12 Geography

Terms	Assessment Types	Total Marks
Term 1	Data Handling project	70
	Climate, Weather and Geomorphology	100
Term 2	Mapwork	100
	Mid-year Examination	300
Term 3	Project	100
	Trial Examination	300

Source: DBE Continuous Assessment of Geography

The above scheme for continuous assessment of Grade 12 Geography is converted to 25%, while the final examination of 300 marks is converted to 75%.

Social Constructivism is centred on the notion that the learner builds new knowledge from the foundation of the knowledge acquired previously. In Grade 12 Geography

mapwork, learners are expected to have prior knowledge of mapwork skills done in Grade 10 and 11, such as locating exact positions in terms of degrees, minutes and seconds, types of scales, such as word, ratio and line scale, directions, true bearing and magnetic bearing and calculating of distance. Learners, for example, should have prior knowledge of measuring distance on a map using a ruler, whereby a learner should start measurement from the zero, instead of making a mistake of starting measurement from one unit.

Learners are to be given the foundation of knowledge by teachers, so that they are able to develop themselves academically. In Social Constructivism, new knowledge should be built on the knowledge the learners previously have. This theory is relevant for this study because Grade 12 mapwork needs prior knowledge of map work skills from Grade 10 and 11. Social Constructivism embraces that every learner builds his or her ideas as opposed to receiving them being from the teacher. Mapwork demands to use social constructivist style of teaching (Schreiber & Valle, 2015:405).

In the classroom, social constructivist teaching involves a change in teaching from a telling-listening relationship to a complex and interactive relationship where the learners' own efforts to understand are the focal point. In this research learners are also the dynamic participants in their creation of their personal knowledge. Social constructivist theory is related to this study as some of the challenges of teaching and learning map work to Grade 12 learners are related to social and environment where the learners come from and the researcher wants to come up with teaching strategies that can solve these challenges. One of the learning strategies is to use collaboration learning strategy, as suggested by Vygotsky. According to Vygotsky the teacher's role is to observe, coach, monitor, advise and facilitate learning, while encouraging learners to take ownership of the learning progression. This on its own, as Vygotsky point out, is one of the teaching strategies that can be used to minimize the high failure rate in Grade 12 mapwork (Liu & Matthews, 2005:399).

2.3 AN EXPOSITION OF ACCEPTABLE STANDARDS OF QUALITY GEOGRAPHY TEACHING

This section gives research-based standards that should be engaged in Geography mapwork classroom in order to decrease the challenges that are expected to be experienced by learners and teachers. Researchers have come up with numerous practices which are helpful for quality Geography mapwork teaching. Such suitable standards are not limited to the following: simplify mapwork language, strongly teach mapwork vocabulary to learners, use of mapwork drawings and illustrations to support communication, manage classroom discourses, check for learners understanding, encourage code-switching in teaching mapwork and teaching learners mapwork in terms of policy documents.

2.3.1 Simplify Mapwork Language

Teachers can simplify the language involved in the topic of Geography mapwork to afford access and opportunities for learners to learn mapwork commendably. Teachers have to be conversant with both the English language used to teach mapwork and mapwork words convoluted in the Geography lesson. The teacher can simplify complex mapwork language and concepts by using language familiar to learners. This will support learners to explain mapwork concepts with ease, thereby understanding mapwork language completely. Furthermore, the teacher can abridge and intricate the mapwork language using enquiry-based approach, as it has been found useful in teaching and learning of Geography mapwork (Awases, 2015:6).

2.3.2 Teach Mapwork Vocabulary to Learners Rigorously

Geography mapwork vocabulary such as scale, directions, mapwork, contours, topographical maps, orthophoto maps, Geographic Information Systems, resolution can also be taught to learners (DBE, 2011b:15). The previously learned vocabulary can be studied when it is used in each mapwork lesson. Learners can reiterate Geography vocabulary in mapwork in their peculiar words. Teaching vocabulary similarly embraces building lexicons, using meanings of words in daily presentations (Makhuvha, 2015:87). Learners advance understanding in mapwork when they are

exposed to vocabulary games like Bingo and repetitions in their lessons. When learners have acquired enough mapwork vocabularies, they will be able to confidently engage themselves in Geography discussions.

2.3.3 Use Mapwork Drawings and Illustrations to Support Communication

Geography mapwork teachers can use drawings to support communication in their lessons. Drawings and illustrations support learners to envisage what was imparted in the lesson and assist them to remember the subject content. Presentations done through drawings and illustrations also simplify mapwork content, especially cross-sections and intervisibility (Okereafor, 2011:26).

2.3.4 Manage Mapwork Classroom Discourses

Geography mapwork teacher can manage their classroom discourses by modelling their own teaching in order to reach all learners in the class. In order to teach learners effectively, teachers in a mapwork class can communicate slowly and simplify concepts using modest language structures. They can avoid the use of idiomatic expressions, and words with double meanings can be explained clearly to learners (Makhuvha, 2015:91). Teachers are also expected to engage their mapwork learners in classroom dialogues. The teacher can give learners enough time to deliberate on geography mapwork challenges.

2.3.5 Verify and Check for Learners' Understanding in Mapwork

Geography mapwork teachers can also verify and second check to establish if learners have understood the mapwork lesson or not. It is suggested that teachers can develop their communicative signs to confirm learners' understanding of the lesson. According to Makhuvha (2015:92), learners can be positioned to use symbols to confirm their understanding of the content, for example, putting thumbs up and down or even sidelong. The teacher should also inspire learners to be open when they do not understand the subject matter. When teachers frequently check for understanding in the mapwork classroom, learners increasingly monitor their own learning and confirm that they are learning, thinking and processing the content

(Makhuvha, 2015:92). Mapwork teachers can get rid of chorus check when confirming learners' understanding of subject matter, as learners just agree that they understand due to their shyness and fearfulness of their teachers. Consequently, mapwork sections are covered with very few learners understanding the subject matter.

2.3.6 Encourage Code-switching when Teaching Mapwork

Makhuvha (2015:92), has showed that learning to read in the home language stimulates reading accomplishment in the second language, as modification occurs. It is in this regard that teachers can be encouraged not to veto the use of the home languages in mapwork classrooms. Learners' home language also plays a pivotal role in Geography mapwork learning, irrespective of whether the teacher communicates the language or not. Tshililo (2016:45), also claimed that when learners are permitted to use their home language in the classroom, their academic performance improves. In the present researchers' view, the extent of the usage of home language and English is determined by teachers in their classrooms. Some mapwork teachers solely teach in English while others code switch between English and the home language. Since learners are not exposed to English in their immediate surroundings, English can be complemented with the home language in the teaching of Geography mapwork (Makhuvha, 2015:95).

2.3.7 Teach Mapwork in Terms of Policy Documentation

Curriculum and Assessment Policy Statement (CAPS) for Geography in the Further Education and Training Phase Grades 10-12 should be used to teach Geography mapwork. This policy document contains a synopsis of topics per term and annual teaching plans. The overview of Geography skills and techniques (mapwork) is also included in the policy documents (DBE, 2011b:3). The teacher should also use the Annual Teaching Plan or Work Schedule to augment quality teaching.

The philosophy of the curriculum includes Geography aims, skills, attitudes and values embedded in the teaching of Geography mapwork. The Geography mapwork teachers can thus focus on the aims, skills, attitudes and values of Geography. One

of the Geography mapwork aims is that learners can practice crucial skills such as literacy and numeracy. In terms of acceptable standards of quality Geography mapwork teaching, the learners can be taught the following subject-specific skills: collecting and structuring information, interpreting and data evaluation. Learners can be taught attitudes and values, such as a sense of fairness, sustainability and equality, respect for the rights of all people and the application of Geography knowledge and skills in learners' personal lives (DBE, 2011a: 8).

Planning is very important for Geography mapwork teachers. When the teacher goes to a class, the following tools can be in place: learning programmes, work schedules and lesson preparation. A Learning programme is a phase-long design that offers a framework for planning, arranging and handling classroom practices for each phase (Tshililo, 2016:44). A Work Schedule is a year-long programme that particularises how teaching and assessment can be done within a grade. It is in the work schedule where the teacher should indicate the resources needed to be used by teachers to cater for different learners' needs. Lesson preparation is drawn from the work schedule and describes how teaching and assessment can be done in Grade 12.

Assessment strategies are an integral part of teaching Geography mapwork. DBE (2012:60) describes assessment as a procedure of assembling, evaluating and inferring information to assess learners in making decisions concerning the performance. However, the responsibility of the teacher is to record the learners' performance as an acceptable standard for quality teaching of Geography mapwork. For acceptable standards of quality geography mapwork teaching, assessment should be a continuing process which addresses, collects and interprets the data about the learners' performance by using diverse assessment strategies (DBE, 2012:60).

Assessment can either be formal or informal and has to be combined as part of the National Education System, so that it can increase the standard of effective learning for all learners, including Geography mapwork learners. When developing assessment tasks, they should be in line with Bloom's Taxonomy of ranking thinking

skills, where low order questions can cater for 25%, middle order for 50% and high order for 25% (Geography CAPS Orientation Manual Grade 12, 2013:29).

For quality teaching of Geography mapwork, the formal and informal tasks given to learners can be moderated. There should be pre and post moderation in Geography mapwork and the correct moderation tools can be used. The process of moderation is to ensure that tasks are reasonable, effective and consistent. This moderation can be employed at school, district, provincial and national level (DBE, 2011b:3).

2.4 GEOGRAPHY MAPWORK-SPECIFIC CURRICULUM KNOWLEDGE ENCOUNTERS

Researchers has shown that Geography mapwork necessitates abstract thinking and mathematical skills and is very difficult to master for learners. Mwenesongole (2016:530), in his study entitled "*the dynamics inducing learner attainment in Geography mapwork at Grade 12 level*", echoed the same idea when he observed that most learners do not achieve well in mapwork because they lack passion in doing mapwork and that they lack the basic skills for map reading and finally they lack simple mathematical abilities. Geography mapwork has a dose of both Physical Science and Mathematics, hence the challenge, especially for Geography learners.

The NSC Examination Diagnostic Report for Geography (2011:61), also held that learners achieved poorly in Question 2, as it deals with Mathematical calculations and many learners do not even endeavour to answer several questions. The report further stated that common mistakes and misapprehensions were on calculating gradient, identifying features on cross-sections and calculating vertical exaggeration. The researcher as currently teaching Grade 12 Geography mapwork observed that learners are also challenged by Question 3 of the mapwork question paper which deals with the application of theory and map interpretations. Learners could not apply the knowledge gained in the theoretical section of Geography to the topographical map. Geographic Information System is also very challenging for learners, as they continually score poorly in it.

The NSC Examination Diagnostic Report for Geography (2012:85), has reiterated similar challenges for mapwork learners in South Africa as the average performance per question in mapwork revealed that calculations and application achieved 40,8%, application and interpretation got 41,6% while Geographic Information Systems (GIS) got 45,6%. The report further revealed that the common errors and misconceptions were on calculations and applications, especially calculating gradient, determining magnetic declination and drawing cross-sections. The aspects perceived to be challenging learners in the 2011 examination also came back to haunt the learners in the 2012 examinations. The common errors and misconceptions on the application and interpretations by learners were on the orientation of topographical map and orthophoto map and finding features studied in the theory on topographical map. Learners also failed to answer GIS questions, as expected. Common errors and misconceptions in GIS were as follows: many learners did not know the terminology such as data layering and attribute data. As suggestions for GIS improvement, the NSC Examination Diagnostic Report for Geography (2011:64), suggested that teachers can be trained in GIS, as very few teachers have prerequisite knowledge to teach GIS.

In the overview of mapwork learner performance (NSC Examination Diagnostic Report for Geography, 2013:89 & 2015:97), it was revealed that fundamental knowledge of calculations and GIS is still problematic amongst learners. GIS is challenging for learners due to the dearth of related software like ArcView and computers. Block (2010:17), proffers that there are poor basics of literacy and numerical competence on the part of the Geography mapwork teacher, who eventually fails the learners. Maduane (2016:61), propounded that unqualified Geography mapwork teachers would avoid arithmetically thought-provoking topics in support of user-friendly ones, at the cost of the future of the susceptible learners. Learners who are able to command maths literacy are able to answer the questions based on calculations, latitude and longitudes, cross-sections, grid references, and so on, with ease. Maps and photographs, however, pose perceptual and conceptual challenges for learners due to their complex nature, as learners should command explanatory, numerical and application skills to comprehend them (Maduane, 2016:144) .

The NSC Examination Diagnostic Report for Geography (2013:89), revealed that it appears that many teachers are not well-informed about various calculations techniques, as shown by the fact that at least countless learners from an examination centre do not try to answer the calculations. The same report also contends that some teachers are not knowledgeable in GIS. This is obvious from the fact that all or many learners from the examination centre do not endeavour to answer questions on GIS. The above scenario shows how challenging mapwork calculations and GIS questions are for both Grade 12 learners and their teachers. This is one of the causal variables for the high failure rate in Geography in general and mapwork in particular, in Limpopo schools. The NSC Examination Diagnostic Report for Geography (2015:79), has also revealed poor performance by learners in mapwork, especially in calculations and GIS. The same mapwork challenges have been identified by the NSC Examination Diagnostic Report from 2011 to date, yet the DBE is unable to harvest the solutions to the problem as learners continued to fail mapwork.

2.5 EXPERIENCES OF LEARNING AND TEACHING GEOGRAPHY MAPWORK IN OTHER COUNTRIES

In this section, attention is given to how learners in Turkey, Nigeria and South Africa experiences learning and teaching mapwork in Geography. Turkey was chosen as a developed country in Europe and Nigeria as a developing country in Africa.

2.5.1 Geography Mapwork Teaching in Turkey

Learners learning mapwork in Turkey experience challenges in mainstream classrooms. Such challenges are not limited to restrictions to physical infrastructures and technological infrastructures. A framework on how each challenge aggravates the problem is briefly discussed below:

2.5.1.1 Physical infrastructures

The Infrastructure are the buildings, classrooms, laboratories and power supplies needed for a school to function effectively. Turkish Geography mapwork education system also faces insufficient infrastructure. Incekara (2010:555) asserts that

insufficient information technologies and large class sizes are some of the problems encountered by mapwork learners in Turkey. This means that Turkish schools also face a shortage of classrooms to accommodate mapwork learners. This is one of the contributing factors leading to learners' poor performance in Geography mapwork in Turkey. The researcher asserts that managing crowded classrooms is a big challenge when teaching Geography mapwork and contributes significantly to learners' high failure rate in Geography mapwork.

2.5.1.2 Technological infrastructures

The introduction of GIS in Geography mapwork in Turkish curriculum in 2005 brought plenty of technological and infrastructural challenges in Turkish schools. The researchers' assertion is based on the fact that GIS requires computers, laptops, softwares, and more importantly, it needs computer laboratories for it to function appropriately. According to Gokmenoglu, Clark and Kiraz (2016:114), Turkish teachers have reported the need for training on these technological materials and activity development in terms of how they should use them meticulously in the classroom.

2.5.1.3 Curriculum changes

According to Jacobs, Vakalisa and Gawe (2011:33), a Curriculum is an accumulation of strategies about teaching-plans on a national, institutional and classroom level. The influences of Curriculum change started numerous years ago in Turkey when the changing world required substantial educational transformation and modifications during the last decades. In the content of 2005 Geography secondary school curriculum mapwork is referred to as geographic skills and practices. Incekara (2010:555) revealed that the content of Geographic skills and practices is comprised of map skills, use of primary and secondary information resources, critical thinking, field trips and Geographic Information Systems (GIS).

According to Tuna (2012:394), the Turkish secondary education Geography curriculum was transformed in 2005. This is when there was an enormous infusion of technological education in primary and secondary schools in Turkey nationally. This Geography Curriculum has a strong emphasis on Information Communication Technology and the introduction of Geographic Information System, commonly

known as GIS (Demircy, 2008:171). Demircy (2008:170), posits that the adoption of Geographic Information System (GIS) in Geography Curriculum is related to three main hindrances, technical factors such as unavailability of hardware, software and data, deficiencies in teacher Training and Curriculum materials. Another obstacle was that there was absence of time for teachers to study GIS and use it in their class activities, unwillingness of teachers to study and use new technology and insufficient place for GIS in the Geography Curriculum (Demircy, 2008:170). Demircy (2008:170), in his study also showed that GIS Software has high technical demands, is a challenge to master, and was not intended for teaching and learning to many teachers. With this Curriculum, GIS became an essential part of Geography education legitimately for the first time in Turkey (Demircy, 2008:172). As a new feature in Geography mapwork GIS, came with its own challenges to the Turkish Ministry of National Education (MONE).

According to Altun and Dogan (2013:51), Turkish teachers are not provided with prospects to cultivate curriculum at school level, especially in public schools; instead it is prepared the by Ministry of National Education (MONE) and Boards of Education and Discipline (BOED) for nationwide use, and it is compulsory for schools to apply it. These variances hve caused the Geography curriculum and mapwork in particular to vary and be ineffectual, which later affected the academic attainment of learners in Turkey.

According to, Incekara (2010:551), Incekara (2012:83) and Aladag (2014:1553), Geographic Information Systems (GIS) is a wide-ranging mapping intended for capturing, storing, examining, retrieving, handling and displaying spatial data obtained from the earth's surface in the form of charts and tables, grounded on the richness of the material entered into the GIS folder. The changes in the Turkish Geography Curriculum in 2005 have employed Geography teachers to hold completely different methodologies commencing from what they were used to in their careers (Öztürk, 2013:471).

2.5.1.4 Teaching-Learning Materials and Resources

Due to the introduction of GIS in geographic mapwork in Turkish curriculum, insufficient teaching and learning resources have become a challenge in Turkey.

Demircy (2008:176), posits that insufficient computer facilities and software are some of the obstacles to effectively integrating GIS into Geography Curriculum in Turkey. Incekara (2012:90), contends that maps and atlases are amongst the most popular technologies used in Geography mapwork. In the study conducted by Ozdemir (2012:344), 70% of the learners agree with the statement that “I would prefer a more enjoyable Geography mapwork lesson” and it was concluded that Geography mapwork teachers still use insufficient audio-visual materials during the lesson.

The shortage of digital data, software and instruction materials were barriers hampering the integration of GIS into the K-12 Geography curriculum. The scenario painted above seems to be validated by Yap, Tan, Zhu and Wettasinghe (2008:59), when they said that lack of GIS software and GIS-based resource packages was one of the barriers impeding the integration of GIS into K-12 Geography mapwork curriculum. Incekara (2010:557), infers that the absence of a Geography mapwork classroom, laboratories and source materials are some of the issues directly affecting the adoption of GIS and mapwork, in particular into Geography courses. Incekara (2010:558), concurs with other researchers that the principal problem facing teachers is what GIS course materials can be used and that the responsibility to find software, training and data to integrate GIS into courses fully falls on geography mapwork teachers .

Gökçe (2009:762), in his study revealed that classroom settings are not suitable for Geography mapwork education and Geography mapwork classrooms. To add to this, there is insufficient equipment to be used in teaching Geography mapwork. According to Gokmenoglu *et al.* (2016:113), the Turkish Ministry of National Education (MONE) delivered 570,000 smart boards to classrooms and one tablet computer to each learner (12 million in total) in Turkey in 2013. Gokmenoglu *et al.* (2016:12), further contends that teachers in Turkey lack the technological knowledge, skills and training to use smart boards and tablet computers commendably in their classroom.

2.5.1.5 Teachers' attitudes towards mapwork due to curriculum changes

It is the researchers' view that both positive and negative attitude of teachers towards teaching and learning of Geography mapwork influence learners' performance. This view was supported by Ozdemir (2012:340) who echoed that attitudes are inclinations that cannot be observed themselves but supposed to lead some observable behavioural tendencies. Teachers can feel more competent themselves to teach Geography mapwork content thereby positively influencing and motivating learners to perform to the best of their ability and pass the subject at the end of the academic year. Ozdemir (2012:340), in the study entitled "*High School learners' Attitudes towards Geography Courses*" observed that 89,5% of the learners emphasise that in order to have a good Geography lesson and mapwork in particular, Geography teachers' deeds in the class and their performance are imperative. This means that the teachers can always depict constructive attitudes in terms of teaching Geography mapwork at all times.

Establishing Geography mapwork research rooms, organising expeditions to proper places may be advantageous in increasing curiosity and constructive attitudes towards Geography (Ozdemir, 2012:345). Social Constructivism and skills that teachers are required to teach such as critical thinking, statistical analysis, evaluation, map skills and computer skills are vague and are not understood by Geography teachers (Öztürk, 2013:475). When teachers lack the above-mentioned skill required to teach Geography mapwork, they tend to be uncomfortable to teach the subject and negative attitudes emerged and discourage them, thereby leading to learner's poor performance. Incekara (2010:552), in his study revealed that teachers' attitudes and perceptions and negative viewpoints from authorities in education for GIS were some of the impediments found.

Incekara (2010:552), posits that many teachers view Geography as remembering places, names and regional facts and thus do not need to use GIS for spatial analysis. The fact that the above assertion came from Geography mapwork teachers themselves tend to constitute a negative attitude confronting teachers in the teaching of mapwork in Turkey. The same variable also impacts learners' negatively when studying mapwork in Geography in Turkey. The reluctance of teachers to devote time and efforts learning new technologies unless there is

institutional funding and an advantage to their career was also a negative attitude on the side of mapwork teachers in Turkey (Aladag, 2014:1534). The researchers' personal observations is that teachers in Turkey were unwilling to further their studies using their own funds, and this on its own showed negative attitude towards mapwork by teachers.

2.5.1.6 Approaches for Teaching Geography Mapwork in Turkey

Ozdemir (2012:344), believes that Geography mapwork teachers still use teacher-centred methodologies during teachings. This means that teachers are still using the traditional way of teaching which uses rote learning since the introduction of a new curriculum in Turkey. This is one of the challenges confronting teachers of Geography in the teaching of mapwork. According to Kuş, Filiz and Altun (2014:318), mostly traditional teaching methods have been used in Geography mapwork lessons. The traditional teacher-centred instruction decreases learners' active participation and thereby negatively influence learners when they study mapwork in Geography. These means that teachers use teacher-directed methods such as telling methods, scaffolding, demonstration and questioning methods when teaching the learners. These are the teaching strategies where teachers directly transfer information to the learners and nothing more. In traditional methods, teachers do most of the work while learners are passive receptors of knowledge (Tuna, 2012:393).

2.5.2 Geography Mapwork Teaching in Nigeria

In this section, the researcher discusses the challenges that facilitate learners' performance when they learn mapwork in Nigerian schools: learners' attitudes towards mapwork, quantitative competence of mapwork and gender dichotomy in Geography mapwork.

2.5.2.1 Learner's attitudes towards mapwork

Incongruous approaches by learners towards Geography mapwork is one of the glitches learners experience when they study mapwork in Geography. Untimely learners' attitudes towards mapwork were also caused by unfortunate backgrounds of learners in mathematics and some major Geography concepts (Filgona, Sababa &

Filgona,16:2). This means that learners who are not conversant with mathematical calculations have negative attitudes towards Geography mapwork. This because most challenging mapwork aspects are mathematical in nature as mapwork has high dosage of Physical Science and Mathematics. Learners who are weak in Physics and Maths have negative attitudes towards mapwork.

Filgona *et al.* (2016:2), opined that prevalent performance by learners in Geography map is an outcome of the misunderstandings they hold about some topics in Geography mapwork and instructional approach. In the study carried out by Rilwani, Akahomen and Gbakeji, (2014:31), teachers, as respondents, showed that 53,57% of the learners' level of interest in Geography is adequate and learners interest is generally higher in Physical Geography with 57,14%, Human Geography follows with 17,86%,Regional Geography with 14,28%, and mapwork with 10,71%. The researcher asserts that the lowest percentage pass in mapwork was due to learners' negative attitudes towards mapwork in Nigeria.

Rilwani *et al.* (2014:34), reiterated related glitches encountered in teaching Geography mapwork by teachers as lack of curiosity in class by learners in Nigeria. Grounded on the study conducted in 15 Secondary Schools in Northern Nigeria, Mohammed (2014:109), observed that lack of learners' interest in Geography mapwork is caused by the following variables amongst others, lack of Geography infrastructures like Geography laboratories needed to simplify the subject, lack of qualified teachers, time allotted to teaching Geography mapwork which is often inadequate.

However, Mohammed (2014:110), suggested the need to make Geography mapwork more interesting since she found that lack of interest was the most important challenge affecting teaching in Nigerian schools, by making available infrastructures needed for effective teaching and creation of conducive environment for learners to develop interest in Geography mapwork. Indeed provision of essential teaching facilities and qualified teachers in Geography mapwork can improve learners' Geography mapwork appeal.

The majority of learners who offer Geography have actually been festered with adverse remarks by their seniors with comments that Geography is wide, difficult, boring, full of abstract thinking and mathematics are always passed around in School (Amosun, 2016:46). This negative attitude makes learners scared of Geography mapwork. Learners' negative attitudes led to the lack of commitment to excellence expected from them. These learners are very lazy, often procrastinate and play truant. The above tendency also led to poor marks in map reading and interpretation in Nigerian schools. According to Okwilagwe (2012:98), attitudes have been described as moderately intense emotions that predispose an individual to respond constantly in a favourable or unfavourable manner when confronted with a particular task. Okwilagwe (2012:97), posits that some learners frequently refer to topographical maps as 'Almanacs', which they just fold and keep inside their bags without touching it. This situation indicates that these learners have no knowledge of topographical maps in their school lifetime until they write their final examination. These learners also see Geography mapwork as a collection of "dead statements" offered as facts (Sofowora & Egbedokun, 2010:46).

2.5.2.2 Quantitative competence of learners in geographical mapwork

Geography mapwork has its foundation in the Physical Science and Mathematics subjects and these two subjects are quantitative in nature. The influence of Physics and Maths on the academic discipline of Geography mapwork has made the subject difficult to the learners when they learn it as it is calculable. Calculations such as straightline distance, area, gradient, vertical exaggeration, magnetic declination and magnetic bearing have a background of Physical Science and Mathematics. Amosun (2016:45), echoed the same view when he observed that a majority of learners has quantitative challenges and as Geography mapwork deals with quantitative reasoning and Mathematical skills, learners are always petrified of it.

Learners appear to do well, to some extent, in same aspects of Geography, but find this aspect of mapwork problematic simply because of their mathematical background (Amosun, 2016:45). Learners who have studied History are often weak in Mathematics, and encounter quantitative phobia. Quantitative phobia is one of the variables that learners face when they learn Geography mapwork in Nigeria. Amosun (2016:46), posits that low, average and high Mathematical ability levels are

found in Geography mapwork classes. However, direct teaching that is often used by teachers make low and average Mathematical ability learners to be afraid.

The researcher observed that learners consider Geography mapwork to be a difficult subject because of their poor background in terms of Mathematics and other mapwork concepts with Physics connotations. According to Adeyemi (2014:22), mapwork involves both declarative and procedural understanding, where declarative knowledge denotes to factual knowledge of concepts, principles, laws, theories, rules and formulae acquired by learners, while procedural knowledge describes the knowledge of the procedure specified for carrying out specific tasks; for example, if a learner is required to calculate the gradient of a given points, learners can follow some procedures for carrying out such tasks in stages. The learners need to identify the requirements for the carrying out of the task and then demonstrate the declarative knowledge.

The quantitative principles and procedures are the ones which are very challenging for learners when they study mapwork in Nigeria. Adeyemi (2014:23), further revealed that declarative knowledge is not enough in mapwork and should be complimented by procedural knowledge, just as procedural knowledge may not be possible without declarative knowledge. Hence, both types of knowledge are necessary for the skills learners acquire in mapwork. Adeyemi and Cishe (2016:156), argue that Mathematical calculations involved in Geography mapwork, such as, bearing, gradient, cross-section drawing, intervisibility, latitudes, and longitude are some of the encounters learners experience when learning mapwork in Geography.

Adeyemi and Cishe (2016:157), propound that the Mathematical ability of mapwork, which is the Mathematical background and competence learners demonstrate in calculation, is a critical element that could have an effect on learners' achievement in mapwork. WAEC (2015:106) echoed the same view when it observed that mapwork, which necessitates map analysis and interpretation, comprises lots of calculations as founded in such topics as longitude, scale, measurement, bearing, gradient, measurement, intervisibility and latitudes. In the study conducted by

Adeyemi and Cishe (2016:169), results point to the fact that learners need a sound mathematical background to permit them to perform well in mapwork in schools.

Adeyemi and Cishe (2016:171), went on to find in their study that learners who displayed low numerical ability achieve below par in mapwork and suggested that remedial classes be organised in mathematics for learners of this classification to make up for this numerical deficiency. Okerefor's (2011:56), findings in the study entitled "*Determining difficult concepts in mapwork among senior secondary school learners in Nsukka education zone*" showed that the learners' most awful achievement was on the concepts that involve calculations in mapwork. The findings implied that most of the learners' lack appropriate Mathematical knowledge; hence, learners' quantitative phobia as one of the problem learners experience when they study mapwork in Geography.

2.5.2.3 Gender Dichotomy In Geographical Mapwork

The influence of gender variances in Geography mapwork is one of the glitches learners experience when they study mapwork in Geography. Studies have also revealed that gender performance in Mathematical oriented subjects is not always in favour of girls but boys (Amosun, 2016:46). The researchers' observation correlate with the above assertion that girls do achieve below par in those subjects and this includes Geography mapwork. Teachers seem to be aware about this, but nothing has been done about it (Amosun, 2016:46). Rilwani *et al.* (2014:35) in his study titled "*secondary school learners 'attrition in Geography in Esan West local government area, Edo State, Nigeria*" the teachers perspective revealed that the majority of teachers (82,14%) were males, implying perhaps that males take more to teaching of Geography mapwork than females. Mohammed (2014:108), in the study entitled "*Some issues on gender and the teaching of Geography in Kano State secondary schools*" observed that the teaching of Geography mapwork is dominated by the males, where it was found that of the total teachers teaching Geography mapwork, approximately 85% were males while only 15% were females.

This again was the reflection of gender dichotomy in Geography mapwork, which also extends to areas of specialisation. The above assertion also confirmed findings by Adeyemi and Cishe (2016:169) that smaller quantity of female learners registers

for Geography mapwork at tertiary level paint a picture of gender sensitivity in Geography mapwork.

However, Mohammed (2014:108), in his study, revealed that gender dichotomy of Geography mapwork has to do with socio-cultural attitudes, which includes discrimination in educational processes in terms of the kind of education, where domestic science and nursing were meant for girls and women, while engineering and medicine were for boys and men. Mohammed (2014:110), recommended that women should be educated on developing their sense of self-confidence and should learn not to undervalue what they can do.

2.5.2.4 Curriculum Changes

The Nigerian Educational System, like any other curriculum in developing countries, has consistently undergone far-reaching changes since 1960's. These curriculum changes started with the outline of 6-3-3-4 Education system, the 6-3-9 system of Education, the Nigerian Educational Research and Development Council (NERDC) and Universal Basic Education (UBE). Restructuring and development of Geography mapwork was also part of this Curriculum modifications. The adoption of the new 6-3-9 system of Education brought some provisions for Geography whose secondary school terminates at the end of the first three years (Sofowora & Egbedokun, 2010:48). In the 2010 basic education curriculum review, Geographic Information System (GIS), fieldwork Survey and cartography was introduced in Geography mapwork. Mapwork, as an essential branch of Geography has been identified as one of the most difficult aspect of Geography (Filgona *et al.*, 2016:2).

Mohammed (2014:106), posits that the most critical revision of Geography curriculum is the making of Geography an elective subject which is no longer a compulsory subject for Science learners. This means that Geography mapwork, which has its origin in Physical Science and Mathematics, is mostly studied by learners without a Physics and Maths background. The same learners who have quantitative phobia, which contributes to high failure rate in mapwork. This also means that Geography mapwork was reserved to learners who are weak in Physical Sciences and Mathematics. The current Geography mapwork curriculum has changed and now focused much on investigation, inquiry and experiential teaching.

The present researcher have observed that investigating and inquiring type of teaching and learning is still very challenging for learners and teachers' alike. According to Rilwani *et al.* (2014:29), Geography is one of the essential and most significant subjects in Secondary school Education in Nigeria.

Despite being one of the core and most important subject in Nigerian education system, Geography mapwork is facing plenty of challenges such as the decline of learners that offer Geography at the senior Secondary level (Mohammed, 2014:105, Sofowora & Egbedokun, 2010:46; Ajaps, 2015:30). Some of the variables include curriculum workload, poor coverage of syllabus and poor background of learners in mathematics. The researcher also observed that Geography mapwork teachers are also inadequate in their preparation.

2.5.2.5 School administration

School administration also plays a pivotal role in the challenges learners experience when they study mapwork in Geography. School administration is also one of the variables that confronts Geography teachers in the teaching of mapwork. The problem of time and time tabling is also one of the variables contributing to the high failure rate in map reading and interpretation in Nigerian schools. According to Amosun (2016:44), three periods of teaching are expected to appear on the time-table, of which two should be put together as one after the other, as double periods, as Geography mapwork requires a much time and practical work .

The findings by Amosun (2016:45), indicated that some schools do not have three periods that should be used for practical work in Geography mapwork. This is one of the reasons why Geography mapwork is difficult for learners and frustrating to teachers in Nigerian schools. Amosun (2016:45), further reiterated that Geography teachers are deserted and even mistreated when they requested for double periods, special time to meet learners for extra classes and asking for payments. Thus, learners perceive Geography mapwork as a difficult subject because in general Geography is not given adequate time on the school time-table to cover all the topics (Adeyemi, 2014:22, Filgona *et al.*, 2016:2).

2.5.2.6 Teaching strategies in the implementation of mapwork curriculum

The traditional teaching strategies used by Geography mapwork teachers in Nigeria are inappropriate. The use of poor teaching methodology is one of the variables that face Geography teachers in the teaching of mapwork. Adeyemi (2008:204), further asserted that many learners perform poorly in the West African Examinations Council (WAEC), where teachers found it difficult to teach as a result of poor teaching methodology and lack of subject matter competence. One of the barriers to learning mapwork effectively was the absence of productive methods of teaching. The common methods in teaching Geography, and mapwork in particular depend on traditional teaching methods of memorisation and drilling. These make learners rely on the teacher for gaining geographic knowledge and map skills.

Filgona, Sababa and Filgona (2016:1), reiterated that conventional teaching strategies, typified by Lecture-Based Learning (CBL), are believed to have done little to improve learners' interest due to their passive, teacher-centred nature. Filgona *et al.* (2016:2), proffer that one of the likely reason identified for the poor performance of learners in Senior Secondary School Certificate Examination (SSSCE) Geography map reading in Ganye Educational Zone was poor teaching methodology. Adeboye (2015:22), further submitted that poor performance in Geography mapwork is attributable to poor method of instruction. Teacher-centred is poor and learner-centred is better because teacher-centred focus in the finishing of syllabus and learner-centred focus on learners.

Amosun (2016:44), postulated that some Nigerian Secondary school teachers are externally glued to teacher-centred method which is not yielding much fruits. Concurring with the above assertion (Sofowora & Egbedokun, 2010:46), asserts that Geography mapwork is taught in a way that discourages open questions, inquiry and active participation. In this teaching methodology, learners' minds and imaginations are totally closed, and a learner cannot think beyond what he/she is taught. Geography teachers, should change their teaching methodologies to learner-centred ones, as they are more relevant to mapwork teaching. Mohammed (2014:109), explained further that the poor method of teaching could be the result of inadequate qualification of the teacher.

Adeyemi and Cishe (2016:156), opined that most Geography mapwork teachers struggle because of the wide scope of the subject, coupled with insufficient time allocated to the subject on the school time table. Often, teachers resorted to the use of the lecture method in a bid to cover the syllabus. The lecture method, however, does not bring any active interaction between teachers, learners and resource materials to be used and learnt in the classroom. The choice of strategy to be used by the teacher can depend on the instructional material available thereof. It was due to the dearth of instructional materials where teachers resorted to the use of unsuitable teaching strategy of teaching Geography mapwork in Nigerian secondary schools. This inappropriate teaching strategy did not allow for active learners' participation and only reduced learners to passive recipient of knowledge. The poor teaching strategies affected learners' performance both in school and public Examinations as alluded to by WAEC's Chief Examiners Report (2015:89).

Adeyemi and Cishe (2016:164), in their study revealed that learning strategies really influenced learners' achievement level in Geography mapwork in Nigeria. In their study entitled *"Effects of discussion instructional strategy on achievement and retention of secondary school learners in human Geography in Minna, Nigeria"*. Falode, Adewale, Ilobeneke, Falode and Robinson (2015:83), recommended that the Government should also begin in-service training, workshops, and seminars for the teachers on the selection and application of proper methods in teaching Geography. Teachers should consider factors such as previous knowledge, duration of lesson class size, resources, number of learners, and teacher's effectiveness before selecting teaching strategy to be used to teach Geography mapwork. The above assertion seems to be corroborated by Ajaps (2015:40), who also recommended in her study entitled *"Geographical Education in the google age: A Case study of Nsukka local government area of Nigeria"* that Geography mapwork teachers should update their understanding about modern approaches to teaching through workshops and seminars.

2.5.2.7 Teachers qualifications and training

The unqualified and under-qualified teachers was one of the variable that confront teachers of Geography in the teaching of mapwork. The researcher views that teachers' training and qualifications as some of the factors that directly affect

learners' performance and achievements in map reading and interpretation skills. The scenario painted above seems to be corroborated by Adeyemi (2008:203), who pointed out that there were significant differences in learners' performance in Geography mapwork on the basis of teachers' qualifications and experience. This means that learners who are taught by unqualified teachers are likely to fail the subject.

In his study Adeyemi (2008:203), contends further that in Ondo State, Nigeria, the bulk of the schools had 2 Geography teachers and 7 schools that should have 7-8 Geography teachers were found to have only 6 of such teachers, while 12 schools that should have above 8 Geography teachers were found to have only 5. The scenario above shows that in these schools, Geography mapwork is taught by unqualified and underqualified teachers and these contribute to high failure rate.

According to Filgona *et al.* (2016:2), one of the reasons identified for the poor performance of learners in SSSCE Geography map reading in Ganye Educational Zone is the scarcity of qualified and experienced Geography teachers. Adeboye (2015:22) and Filgona *et al.* (2016:2), also posit that poor performance in Geography mapwork is attributed to inadequate qualified teachers. This means that teachers who knows nothing about teaching of Geography mapwork are employed to teach it. These are the kind of teachers who are going to struggle in Geography mapwork and therefore, find it challenging to teach it. Consequently, this will contribute to high failure rate of mapwork in Nigerian schools.

The underqualified and unqualified teachers have shortage of the mathematical backgrounds and map thinking skills required to teach mapwork. Amosun (2016:45) and Filgona *et al.* (2016:2) also held similar views that Geography mapwork teachers are not effectively prepared and they are poor in mathematics. Such teachers avoid teaching of Geography mapwork because it necessitates abstract thinking and mathematical skills, and this is evident in the performance of learners who are unable to do the majority of the mathematical-related questions in their examinations (Amosun, 2016:45).

The same unqualified and underqualified mapwork teachers often lack the experience of being markers and examiners of map reading and interpretation of WAEC as they are inexperienced. This challenge often confronts teachers of Geography in the teaching of mapwork in Nigerian schools. Ezeudu and Utazi (2014:42), assert that Social Studies graduates, Geologists and Town and Regional Planning graduates are engaged in teaching Geography mapwork in Nigerian secondary schools. These caused competency gaps among Geography mapwork teachers and contributed to the high failure rate in Nigerian secondary schools.

2.5.2.8 Teacher's attitudes towards mapwork

Attitude is one of the variables that face Geography teachers in the teaching of mapwork. Attitude is an important variable because it has the potential to affect the behaviour of Geography mapwork teachers in Nigerian schools. For example, attitudes can influence the way teachers teach and the teaching and learning strategies used by the teachers themselves. Amosun (2016:45) and Filgona *et al.*, (2016:2), proffer that the majority of teachers appear uncommitted to excellence because their attitude to teaching of mapwork is pitiful. Amosun (2016:45), further contends that teachers complain and shy away from their legitimate responsibilities when salaries are not paid or delayed, and they seem to care less about exceptional performance in the final results of their learners. Negative attitudes of Geography mapwork teachers contribute to poor performance in WAEC examinations in Nigeria.

Teachers can hardly improvise, take a decision on how to get suitable materials, take extra periods after closing hour or even invite resource persons to help them tackle aspects they always find challenging to teach (Amosun, 2016:45). In his study (Amosun, 2016:45), observed that it is empirically evident that majority of Geography mapwork teachers, do not attend in-service training. This happens because of the negative attitudes teachers have towards mapwork in Nigeria. The fact that Geography mapwork teachers do not attend in-service training makes them ineffective in the teaching of Geography mapwork. These negative attitudes have grave consequences on the learners' attitudes and influence learners' poor performance .

If learners are to do well in school, the attitudes of their Geography teachers must be right (Okwilagwe, 2012:98). The teachers' attitudes towards Geography mapwork should always be positive and learners will be motivated to learn. The above assertion seems to be corroborated by Sabitu and Nuradeen (2010:389), when they postulated that the achievement of any teaching and learning process, which influences learners' academic performance depends on how effective and efficient the teachers are. In the same vein, Rilwani *et al.* (2014:29), reiterated that teacher knowledge plays a crucial role in classrooms, as it affects teachers' choice of suitable strategies during the teaching process.

2.5.2.9 Teaching-learning materials and resources

Learning resources in Geography mapwork play a crucial role in the process of teaching and learning. This means that in order to teach mapwork effectively at secondary schools in Nigeria, it is necessary that schools can have sufficient resources. Inadequate teaching materials used by Geography mapwork teachers in Nigerian schools was a challenge to Nigerian education system. The scarcity of teaching resources and suitable textbooks was one of the likely reason identified for the poor performance in SSSCE Geography map reading in Ganye Educational Zone, Nigeria (Filgona *et al.*, 2016:2). Learners also lacked appropriate instructional materials to reflect and demonstrate the aspects being taught by their teachers.

Poor performance in Geography mapwork is also attributable to insufficient instructional materials (Abidoeye, 2015:22; Mohammed, 2014:105; Filgona *et al.*, 2016:2). Geography mapwork requires a lot of materials such as different topographical maps, mathematical set, rulers, plain sheets, maps from past WAEC question papers and Joint Matriculation Examination Board, transparent paper and topographical maps are not available at schools (Amosun, 2016:44). Geography mapwork teachers also use protractors and calculators. Multimedia packages as teaching aids can also be used to improve the performance of Geographic Information Systems (GIS).

Amosun (2016:45), in his study, revealed that Geography classrooms are not available in schools. The Geography room is important, as it should be a place that has special tables and chairs, to allow easy spread of topographical maps on them.

Without a Geography room, incorrect tables and chairs are used by learners during map reading and interpretation ineffective. Other types of topographical maps and orthophoto maps should be placed in this room. The lack of Geography room led to poor storage facilities. The researchers' personal observations as a departmental head observed that topographic maps and orthophoto maps collected over years disappear over time due to poor storage facilities, as some are kept in places where rain and sunlight easily enter and are soon destroyed (Amosun, 2016:45). Due to these, teaching mapwork could be difficult as reading materials cannot be found readily available in the school.

Mikanjuola and Sidiq (2013:3), in their study entitled "*Geography laboratory and observation centre: The missing vital infrastructure for effective teaching of Geography in school in Ekiti State, Nigeria*" observed that all sampled Schools (100%) in the State, lacked a Geography laboratory, a Geography library, a Geography room, and thermographs and no school had a separate room exclusively dedicated for the teaching of Geography. Mikanjuola and Sidiq (2013:5), further asserted that 50% of the Schools were in possession of the globe and topographical maps while their field observation revealed that they were not only very few in number, the available ones were not only outdated but in most cases they were tattered.

Adeyemi and Cishe (2016:172), in their study entitled "*Effects of cooperative and individualistic learning strategies on learners' map reading and interpretation*", recommended that school authority and teachers of Geography should work together to safeguard enough instructional materials, are provided for the teachers to augment their teaching.

2.5.3 Geography Mapwork Teaching in South Africa

In South Africa, teachers and learners also experience the following school-related variables when they learn Geography mapwork: learners' use of language, learners' absenteeism in classrooms and learners' attitudes towards mapwork, learner-teacher support materials, class size and attitudes of teachers.

2.5.3.1 Learner's use of language

Learners' use of language is also one of the variables that learners experience when studying mapwork in Geography. South Africa's challenge of medium of instruction in schools' dates back to the apartheid era, when the riots of 16th June 1976 led to the removal of Afrikaans as a language of education in schools and driven in the new dispensation wherein English became the medium of teaching for the Education of Black South Africans. According to Hlaithwa (2013:24), the home language Education policy specifies that learners should start learning at school in their home language up to Grade three. In most schools, the language of instruction changes from the African languages to English, which means that more than 80% of South Africans learn in a language different from their home language (Howie, Venter & Van Staden, 2008:551). These pose a serious challenge to the learners especially when studying Geography mapwork. The Language of Learning and Teaching (LoLT) in the early primary school is the mother tongue of the learner.

According to Rammala (2009:21), most of Grade 12 learners are struggling to communicate in English and that could be one of the factors that puts them at a disadvantage, since that is the language used to respond to questions in the examinations. The fact that Geography mapwork is also taught in English also has a major impact on the academic performance of learners. In South African schools, teaching and learning often takes place in the language that is not the first language for them and this creates many challenges. In South Africa, it is often the case that rural children grow up in a polyglot context and the home language is their major tool of communication in domains covering interactions, not to mention everyday culture and values (Sao, 2008:29). Rammala (2009:56), further explained that teachers also raised the language issue, that learners cannot read in their mother tongue, and it is worse in examinations and tests for the reason that they cannot read examination questions.

2.5.3.2 Absenteeism of learners in Geography mapwork classroom

The learners' rate of absenteeism in Geography mapwork classrooms is also a variable learners experience when they study mapwork in Geography. The researcher also observed that regular absence of learners from schools causes backlogs in Geography mapwork. These learners often find it difficult to catch up on

mapwork concepts as they perceive it to be difficult. According to Sao (2008:21), learners who have a backlog find it difficult to keep pace with school work. The learners absenting themselves from school are likely to fail the subject. Mboweni (2014:3), also hold a similar view, that learner absenteeism is one of the major determinant of poor academic performance, as learners miss classes and ultimately they fail or drop-out. The high rate of absenteeism is also caused by overcrowding in classes, as teachers are unable to control and manage too many learners in one class. When the class is big it is even difficult to know the names of the learners and let alone know their names .

2.5.3.3 Learners' attitudes towards mapwork

Positive attitudes learners in Geography mapwork in South Africa will help schools to produce GIS technicians, geologists, cartographers and environmentalists. However, if the attitudes of the learners towards Geography mapwork is positive, the learners will perform better. The attitudes of learners towards mapwork is also the variable learners experience when they study mapwork in Geography classrooms. The researcher's view is that most learners experience difficulties in learning mapwork. This view is supported by NSC Diagnostic Report for Geography (2012:83), which noted that learners appear to be ignorant since they did not read examination instructions, or they did not use the given information such as sketches, graphs and photos to support their answers.

The key to learning Geography mapwork also depends on the motivational level of the learner. Motivation, be it intrinsic or extrinsic, is regarded as the motivating force to comprehend the learning in Geography mapwork. According to Maduane (2016:83), Geography mapwork learner should have a sense of value to participate in the subject and if the sense of value, is not obtained, it turns into a barrier for the learner to continue to learn Geography mapwork.

According to Rammala (2009:19), attitudes are learned throughout life and are personified within our socialisation process. As humans, we observe others and also assess their attitudes on the basis of verbal and non-verbal communication style and behaviours. The negative attitudes towards learning could result in learners performing poorly, which prevents them from passing their geography mapwork. Van

Heerden (2008:10), identified the following attitudes as variables that have a negative influence on the learning process: absence of willpower in learners: they are generally inclined to give up when faced with a problem, rather than struggling with it; deficiency of motivation, learners have no intrinsic initiative to achieve academically, a lack of ambition, the children have no craving for success or goals to strive to; a lack of self- discipline as learners do not have the discipline to work on their own without supervision. These learners tend to think negatively about themselves and developed feelings of inadequacy and inferiority complex which further deepens learners' poor performance in Geography mapwork.

Learners' inappropriate attitudes also includes motivation and self-esteem of individual learners towards their teaching and learning of mapwork. The sense of despair can also have a negative impact on mapwork academic achievement. The fear of learners' failure leads to low appreciation and causes a sense of incompetence in Geography mapwork. These demoralised learners' trust that they lack the capacity to be effective and that it does not even make logic to try to succeed (Hlaithwa, 2013:26).

Van Heerden (2008:10), revealed that learners with low self-esteem describe themselves as lazy, unable to do their work, slow, dumb and irresponsible. These negative views of themselves also influence their academic achievement on mapwork negatively. Self-esteem, negative attitudes and demotivation are the most prominent variables challenging learners to achieve academically in mapwork. The researcher has also observed that many of the learners even fail to make their own notes as expected from them due to their negative attitude towards Geography mapwork.

2.5.3.4 The constant changes within the Geography mapwork curriculum

The South African curriculum challenges started when the Bantu Education Act of 1953 was passed under Apartheid government. These showed that the impacts of curriculum changes started many years ago in South Africa. The Bantu Education System was solely meant for Blacks and characterised by discrimination, racism and inequalities as Blacks were regarded as inferior. The racist and sexist Bantu Education system used traditional educational approaches which was more teacher-

centred. When the first constitutionally voted South African government came into power in 1994, led by the African National Congress (ANC), the apartheid school Curriculum was also changed. The South African government felt that there was a prerequisite to develop a Curriculum that gave emphasis on equal opportunity and quality for all learners (Tshiredo, 2013:9).

In 1997, Curriculum 2005 was launched and implementation started in 1998. These led to the adoption of Outcomes-Based Education (OBE) in South African education system, which is based on social constructivism theory of Vygotsky. The OBE is learner-centred and based on dynamic learning, which is based on the premise that knowledge, skills and values are best achieved when learners are keenly involved in the learning development. Even Geography mapwork was changed to be an active learning subject as part of new curriculum (Tshiredo, 2013:9).

There were some implementation challenges in curriculum 2005, as it was found to be too complex and the then Minister of Education, Mr Kader Asmal recommended that the curriculum be streamlined. The streamlined curriculum became known as the Revised National Curriculum Statements (RNCS) and was implemented in 2002. The revised Curriculum, commonly known as the National Curriculum Statement (NCS), gives teachers more guidelines on the concepts and content which they should impart. It is the NCS which has included the Geographic Information System (GIS) in mapwork curriculum. The NCS gave teachers' freedom to adapt and interpret the Curriculum to suit their own school settings. Teachers were forced to change their teaching styles to learner-centred teaching as learners needed to become problem solvers and needed to be actively involved in problem solving tasks. The same NCS frustrated teachers more due to its overload which led to underperformance of learners including in mapwork. The introduction of Outcomes-Based Education left teachers with key accountabilities of implementing new changes in the Curriculum (Tshiredo, 2013:12).

Due to the implementation of OBE and the NCS, the Curriculum in South Africa was constantly faced with many educational challenges that started from the Bantu Education era. The implementation challenges exacerbated until the current incumbent Minister of Basic Education, Mrs Angie Motshekga appointed a Task

Team to identify the challenges, address those challenges and come up with intervention strategies. The Task Team was tasked with investigating the curriculum policy guidelines, learners' progression, Continuous Assessment, Learner-Teacher Support Materials (LTSM) and Teacher Support and training. The Task Team found that there was a plethora of policies, guidelines often with discrepancies and confuse teachers, complicated planning requirements and administrative burden of teachers make things difficult to deliver in the classrooms and the training of teachers should be subject specific .

The Task Team also came up with the following recommendations: that Curriculum and Assessment Policy Statement (CAPS) should be implemented, teacher workload should be reduced particularly with regard to administration work, the LTSM should be centralised, the number of Learning Areas in Intermediate Phase should be reduced. The findings and recommendations of the Task Team led to the birth of CAPS in the education system of South Africa. Tshiredo (2013:13), asserts that the Task Team appointed by the Minister of Basic Education came up with the New Policy of education called Curriculum and Assessment Policy Statement (CAPS), to be implemented in grade R-3 and Grade 10 in the year 2012, Grade 4-9 and Grade 11 in 2013 and Grade 12 in 2014.

The fact that Geography mapwork teachers have to deal with many curriculum changes without understanding what was expected from them also contributed to the poor performance in Vhembe District. Due to the implementation of CAPS in the education system, the following Geographic Skills and Techniques, commonly known as mapwork curriculum, were introduced to Grade 12 learners under four main topics namely; Geography mapwork skills, Topographical maps, Aerial photographs and orthophoto maps, Geographical Information Systems (GIS), using atlases and Fieldwork (time permitting) (DBE Geography CAPS, 2011:15).

2.5.3.5 Administering of assessment in Geography mapwork

Assessment forms an important part of teaching and learning in South African Curriculum process. It is a Systematic way of gauging how well learners are progressing in Geography mapwork and in a Grade (DBE, 2011b:3). Some

examples of formal assessments include tests and examinations, and the results of which are to be used to gauge the learners' performance in Geography mapwork.

It is usually in the Geography classroom where mapwork skills are taught to learners (Innes, 2012:93). However, assessment in Geography is still a challenge in the South African education system, as the subject is assessed using the apartheid curriculum assessment systems twenty-two years into democracy. The researchers' scenario pointed above seem to be corroborated by Innes (2012:96), when he infer that following the forms of assessment system presented in the 1970's, the learners who selected Geography as a Grade 12 subject wrote two examination papers. The Geography theory paper testing content knowledge, as paper 1, and the practical paper assessed their map skills, as paper 2. The researcher has observed that the overall mark for each paper is weighted as follows: Paper 1 (Theory) has 225 marks while paper 2 (mapwork practical) has 75 marks. Both papers are written in one day, which is cumbersome for learners. Paper 1 is a 3 hour paper written in the morning, while paper 2 is 1½ hour paper which is written in the afternoon. This means that Geography Grade 12 learners sit for a 4½hour examination in one day (DBE, 2011b:52). Geography is thus the only subject where two papers are written in one day and it is not surprising that there is a high failure rate in the subject nationally.

Paper two of Geography, which is commonly known as mapwork, is the one under study. According to DBE (2011b:57), mapwork is assessed as follows during the end- of --year examination in South Africa:

- Marks: 75
- Time: 1½ hours
- Question 1: Multiple choice questions (15 marks).
- Question 2: Mapwork Calculations (20 marks).
- Question 3: Analysis, Interpretation and application of Theory (25 marks).
- Question 4: Geographic Information Systems (GIS) (15 marks)

The Assessment of Natural Sciences, Mathematics and Social Sciences in the Senior Phase (Grade 7-9) and mapwork of Grade 10 and 11 also affects the results of Grade 12 mapwork. The researcher has observed that in 2015 December, the

Department of Basic Education (DBE) Mrs Angie Motshekga issued a circular on progressed learners. The policy meant that a learner can fail only once per phase and after repeating a year they are pushed through to the next grade, even though they have not done well. This is done to ensure the learners remain within the age group of their class grade. These are the same learners progressed to Grade 12 who find it difficult to pass mapwork. As the researcher was busy with the research, in December 2016, the Department of Education issued, another circular instructing public schools to condone learners who got 20% for mathematics in the senior phase (Grade 7-9) to the next grade. This decision has serious repercussions for the future of education in South Africa, and mapwork in particular, as the department has abandoned the previous 40% pass rate for the compulsory subject. These are the same learners who are doing Geography mapwork this year (2017) in Grade 10 and the same mapwork has a full dose of mathematical calculations (DBE, 2011a:49).

In the Sunday World of 11 December 2016 titled “20% pass mark will hurt pupils”, Milazi (2016:12), posits that the decision to pass learners who got 20% for mathematics in Grade 7 to 9 has outraged parents and many in the education sector are saying that the department is avoiding dealing with the real causes of poor maths results. Mhlambi (2016:12), also held the same view in his article titled “*Low maths pass a fail in anyone’s books,*” in which he wrote that according to the World Economic Forum (WEF) Global Information Technology Report (2016), South Africa’s Mathematics and Science education quality is lower than that of Nigeria, Mozambique and Malawi, ranking 137 out of 139 countries .

Concurring with the above assertion, Milazi (2016:12), the editor of the Sunday World, asserts, that the Human Sciences Research Council (HSRC) reports in December 2016 revealed that South Africa’s Grade 5 learners had Science and Mathematics scores that were among the worst in the world. These are the same learners who are later to study mapwork which has a high dose of Mathematics and Science, and eventually contribute to high failure rate of mapwork in South Africa. What is also worrying is that South Africa is spending many billions in education than all the countries mentioned above, yet mapwork results are still worrisome.

2.5.3.6 School administration

School administration is important in the curriculum implementation process. This can be viewed in terms of allocation of funds for teaching resources and teacher professional development. All these responsibilities are vested on the school principal. School administration influences teacher involvement in curriculum implementation to a great extent. The principal's supervision involves giving guidelines to the school to offer diversified curriculum according to policies. School administration revolves around the day to day running of the school, especially the school mapwork curriculum. According to the Limpopo DoE Provincial Report on the Monitoring of School Readiness (2010:8), the general timetable was not ready on day one of term one in two secondary schools in Vhembe District.

The Report also revealed that period allocation for all subjects of all grades was not available in 20 secondary schools in Vhembe District, and the time table for enrichment activities was not available in 32 secondary schools in Vhembe District alone. School administration also encountered challenges of funds allocation from the Limpopo Department of Education, as the money for Norms and Standards always comes very late and schools are sometimes given very small amounts not budgeted for by the schools. The researcher has also observed that the money allocated to schools always comes in April, yet the school budget ends in 31 December each year. Due to these, schools fail to allocate and buy enough Learner Teacher Support Materials.

The researcher has also observed that Geography mapwork teachers face challenges in terms of content coverage, limited time and teacher workload. Geography is allotted four hours of teaching time weekly and this includes revision, consolidation and assessment time, including formal and informal assessment. In this provision, Geography mapwork topics can be included throughout the year (DBE, 2011b:11). These conditions force teachers to use the traditional teaching styles, to finish syllabus on time. The researcher has discovered that Geography syllabus is so vast; thus, it is so difficult for teachers to cover it using four periods per week, including four informal homework and classworks. Fieldwork is one of the best teaching strategy in mapwork, which is learner-centred. Thus, Grade 12 learners should also do fieldwork if time permits and due to time and logistical

limitations, much of the fieldwork will need to be conducted outside lesson time (DBE, 2011b:11). The above scenario indicated that even the DBE is not taking fieldwork very seriously as teachers are not obliged to do it.

2.5.3.7 Learner-Teacher Support Materials (LTSM)

The availability and utilisation of LTSM are critical in the curriculum implementation process in South Africa. In this study, Learner Teacher Support Materials (LTSM) refers to any operational materials that simplifies teaching and learning, for example, newspapers. Learners Teacher Support Materials (LTSM) in mapwork play a role in the process of teaching and learning and schools should have abundant resources in order to teach mapwork effectively. Learners are anticipated to learn in a favourable learning environment where they would be able to take part in the instructional Curriculum and attain great educational performance (Tshililo, 2016:46).

The researcher has observed that Geography mapwork needs the following Learner Teacher Support Materials, 1:50 000 topographical maps, 1:10 000 orthophoto maps, different types of maps to be used as examples and visual aids in the classrooms, wall maps, protractor, magnetic compass, Geographic Positioning Systems (GPS) devise, Google Earth computers, laptops, GIS softwares, Aerial photographs, Synoptic weather maps, atlases, temperature graphs satellite photographs, rulers, calculators, cameras, cellphones, pencils, felt-tip pens and textbooks. In most of the schools there are many printed resources than audio-visual resources. These are the LTSM that contribute for the implementation of successful instruction. The dearth of the above mentioned LTSM in Limpopo Province, and Vhembe District, in particular, is one of the variables learners experience when they study mapwork in Geography. According to the Limpopo DoE (2010:8), the provincial report on the monitoring of schools revealed that there was a shortage of textbooks in Grade 8-12 in 19 schools in Vhembe District and a shortage of stationery in 28 secondary schools in Vhembe District.

Mapwork is a practical oriented subject, hence the need to use these resources. The process of purchasing new resources is too cumbersome because of the shortage of finances at schools. The same challenge is encountered in the replacement of torn and worn out maps. The lack of modern equipment such as

computers, GPS and GIS softwares like ArcView which, are very expensive results in learners to do paper GIS. Without proper LTSM, teaching is impossible. The researcher also observed that most rural schools in Vhembe District have no libraries and where they are available, they are not well-equipped. The inequalities regarding the quality and distribution of LTSM are still worrisome, even after celebrating 22 years of democracy in South Africa. There is no researcher who can ignore the role and function of LTSM in enhancing the quality of education. This is because LTSM are instruments which teachers use to teach ,and learners use to understand the content easily. Rammala (2009:23), posits that there is a sound relationship between learner performance and the quality of the resources available to learners.

2.5.3.8 The school and class sizes

Nel (2010:70), have shown that school and class size have an influence on learner performance in South Africa. Overcrowded classroom is one of the variables that learners experience when they study mapwork in geography. According to the DBE (2011a:67), the recommended learner-teacher ratio for primary schools is 1:40 and in secondary school is 1:35. Overcrowded classrooms, especially in the rural areas, have an impact in terms of teaching strategies to be used by teachers, learners' discipline and teachers' feedback. Teachers felt that one of the major drawbacks in the implementation of OBE was overcrowded classrooms (Nel, 2010:77). Many teachers have to handle huge classes and there are instances where two teachers share a class of 270 learners (Sao, 2008:29). This means that the overall learner-teacher ratio is too high for any meaningful Geography mapwork to take place. In some classes, teachers do not even have a space to stand and write on the chalk board when they are teaching. The overcrowded classrooms encourage learners to copy from each other.

In a large class, it is very challenging for teachers and learners to communicate because it is difficult for teachers to observe and assess all learners' responses at once. The present researcher also observed that overcrowded classrooms are not conducive environments for effective teaching and learning. According to the Limpopo DBE (2010:11), the provincial report on the monitoring of school and readiness in January 2010 revealed that there was lack of an adequate number of

classrooms in 29 Secondary schools in Vhembe District and lack of adequate furniture for learners in 30 Secondary schools in Vhembe District. Overcrowded classrooms are thus of great concern to most schools in Vhembe District.

Teachers generally believe that in large classes, it is tough to maintain good discipline and create a participative environment (Jacobs *et al.*, 2011:181). When a class is overcrowded, there is also a challenge of learner diversity, hence, the teacher will have to deal with learners of different ages and different abilities. Other problems with large classes include the shortage of textbooks for learners and the fact that the teacher is unable to give each learner individual attention (Jacobs *et al.*, 2011:181)

2.5.3.9 Traditional approaches to teaching Geographical mapwork

Poor teaching strategies are the strategies that make learning difficult for learners. These are the strategies which were used during the Bantu Education era in South Africa. According to Nel (2010:39), these poor teaching strategies are referred to as deductive teaching strategies, where the teaching tends to be more teacher-centred and learners' participation is limited to the application of a given statement; for example, lecturer methods, question and answer and drill and practice. The researcher observed that prior to 1994, this type of teaching strategy was referred to as content-based education. According to Nel (2010:43), the following are the characteristics of content-based education or deductive teaching strategies: learners are passive, examination driven approach, rote learning approach, it is teacher-centred, rigid time-frame for content, syllabus is rigid and non-negotiable and learning responsibility lies with the teacher.

In South Africa, most of the teachers are still using the highly teacher-centred methods like telling methods. According to Jacobs *et al.* (2011:163), the telling method is a way of teaching in which the teacher delivers an oral presentation about a particular topic to a class. This is the oldest type of teaching style which is used by teachers all the time. According to O'Grady (2008:4), the telling method was employed from the time of the Sophists who lived some million years ago. The researcher has also observed that some teaching strategies causes of poor achievement in mapwork. However, many teachers are still using outdated,

traditional methods of teaching in mapwork. The teacher-centred approach limits the involvement of the learners, to such an extent that they become passive consumers instead of interactive contributors to the classroom situation (Monteith & Nieuwoudt, 2008:29). The classical teaching style, where “telling” method dominates, and the learner is a passive listener, are ineffective to teach Geography mapwork.

Many geography mapwork teachers are indeed caught up in the traditional method of teaching, where the teacher talks and the learner listens. This indeed is a poor teaching style. In Grade 12 classes, learners are taught mapwork few weeks before they write their final examination. In this case teachers discuss previous question papers with learners encouraging, them to cram the questions and answers. Mapwork teachers also relied on notes which they dictated to learners where learners are never given an opportunity to ask questions or do any abstract thinking. In this poor style of teaching the materials are written on the board and learners copy it without any understanding. Traditional teachers assume that learning takes place when they take more time to explain concepts. The main role of a traditional teacher is to disseminate information to learners (Jacobs *et al.*, 2011:169).

2.5.3.10 Attitudes of teachers towards mapwork

Attitudes are learned during the course of lifetime and are personified within our socialisation process. All of us observe others and evaluate attitude on the basis of communication style and manners and this also happen in Geography mapwork teachings. Teachers’ attitudes are variables confronting teachers when teaching mapwork in South African schools. The approach teachers have to teaching mapwork affects the quality of learners’ performance. According to Van Heerden, (2008:19), teachers with a negative attitudes and beliefs also tend to express their negative attitudes and beliefs verbally towards learners. These teachers tend to have very low expectations of the learners studying geography mapwork and unfortunately learners tend to conform to these teachers’ expectations.

Maduane (2016:136), in her study, revealed that 43,75% of teachers strongly agree that there is a neglect of Geography mapwork at some stage when they teach. Consequently, the learners affected would perform poorly in Geography mapwork examinations. This educational fraud done by teachers is caused by their negative

attitude towards Geography mapwork. Teachers with negative attitudes even do not have a passion to teach learners on Saturdays and during holidays. There is also lack of commitment to excel due to the teachers' negative attitudes towards mapwork.

2.5.3.11 Teachers' qualifications and training

Teachers' qualifications play a pivotal role in the educational performance of learners in Geography mapwork in Grade 12 in South Africa. Presently, there are two ways of becoming a qualified secondary teacher in South Africa. The first way is by completing a four-year undergraduate Bachelor of Education: Further Education and Training (FET) degree and the second way is by capping an undergraduate degree with a Post-Graduate Certificate in Education (PGCE) (Maduane, 2016:138). A qualified secondary teacher also has a three-year Secondary Teachers Diploma or Diploma in Education (secondary phase) from the now defunct colleges of education. Any teacher who is teaching without the above-mentioned qualification is regarded as unqualified and underqualified teacher in South Africa. This however, excluded qualifications from foreigners which are capped by the South Africa's Qualifications Authority (SAQA) (DBE, 2011b:70).

The unqualified and under-qualified teachers is also a variable that face teachers of Geography in the teaching of mapwork in South Africa. There are presently 7,076 unqualified teachers on the Education departments' workforce in South Africa. These are teachers who have only a Grade 12 qualification. There are also 2,642 under-qualified teachers in the country, who have completed Grade 12 and who only have two years of tertiary studies under their belt. This means that there are nearly 10 000 unqualified and underqualified teachers on the payroll in South Africa. Kwazulu Natal Province was the most affected province as it has employed more than 85% unqualified teachers with just a Grade 12 Certificate (DBE, 2011a:70).

Incompetence in Geography mapwork teachers' failures is displayed in their failure to select textbooks (Maduane 2016:4). These are the same teachers who are expected to select the Geography textbook for the learners and their competence should come in handy. Block (2010:7), asserts that some Geography teachers' incompetence in the subject knowledge, subsequently disempowering their learners.

These are teachers who resort to teaching Geography mapwork in their mother tongue, to facilitate learning, as they are conceptually challenged and unqualified, and this makes the matters worse. A Teacher who does not have a deep command of the knowledge of Geography mapwork becomes a barrier for the learners of the subject he/she is teaching. This teacher will be unable to assist learners who are intending to become geographers in future, therefore killing their career choices. The underqualified teacher always feels threatened by the learners in class. The threat of failure halts learners from learning from the teacher because the subject teacher does not live up to the learners' expectations of Geography mapwork (Maduane, 2016:75). If the teacher is incompetent in teaching Geography mapwork, the learners are the losers and are the victims of the teachers' shortcomings in teaching the subject.

Maduane (2016:119), in the study entitled "Barriers to Geography learning and teaching in Grade 12 in Limpopo Province" observed that 43,8% of Geography teachers had a matric (Grade 12) certificate. These findings sparked a concern that twenty-two years since the dawn of democracy there are many subject teachers who are still not qualified to teach Geography who are still teaching geography today.

NSC Examination Diagnostic Report for Geography (2014:96), gives a synopsis and detailed analysis of learner performance for each mapwork question in examination every year. In spite of providing general suggestions for improvement each year, the same difficulties persist, namely that candidates lack content knowledge and basic definitions of concepts. Furthermore, they do not manage with questions that involve middle-and high-order thinking skills and application of knowledge, basic knowledge of calculations and map interpretation. Thus, despite all the efforts, mapwork results are still unable to cross the rubicon. This lower quality education and poor learner outcomes are a result of the recruitment of professionally unqualified and underqualified teachers into the teaching profession in South Africa. However, poorly trained teachers often produce poorly educated learners.

Nkosi (2017:7), in his article titled "*Blame Angie for failures*", revealed that in its 2016 NSC Examination Diagnostic Report on learner performance, the department largely counted Grade 12 poor knowledge of their subject content as cause for exam

failures. Nkosi (2017:7), further stated that the problem appeared to be compounded by an apparent shallow grasp of the content areas by teachers, or by teachers neglecting to cover certain aspects of the curriculum. The poor quality of responses even in lower-order questions, suggested that some candidates were not adequately exposed to the relevant content of mapwork at all. This again put the blame on teachers who are underqualified, but the department is unable to solve the challenge. The teachers' poor skills, competency and qualifications to teach are evidenced by the performance of learners in mapwork. The evidence based on learners' mapwork performance in the NSC examination showed a desolate picture of teachers' competence in South Africa.

2.6 TEACHING STRATEGIES THAT CAN BE ADAPTED TO TEACH GEOGRAPHY MAPWORK

The birth of OBE in South Africa's education system led to Social Constructivists approach to teaching, which is learner-centred and upheld active participation from learners. For this reason, the researcher discusses various learner-centred teaching strategies that can be adapted to teach mapwork in the South African context. The learner-centred strategies are emphasised to inclusive teaching strategy, collaborative teaching strategy, cooperative learning strategy, fieldwork teaching strategy, discussion teaching strategy and project-based teaching strategy.

2.6.1 Inclusive Teaching Strategy

According to Nel, Nel and Hugo (2012:11), inclusive teaching is a learning environment that endorses the full personal, academic and professional development of all learners, regardless of their femininity, religious conviction, culture, sexual preferences and learning styles language. DBE (2013:13a), further submitted that inclusion is a procedure of addressing and responding to learners' diversity by increasing their participation in learning and reducing exclusion within education. Chaula (2014:19), added that inclusive education means that everybody should take part in the general public on an equal basis scholastically, socially and culturally. This means that when teaching mapwork teachers should incorporate children with learning difficulties into their lesson preparation in order to assist them.

Learners' physical barriers, such as hearing loss, visual impaired, chronically sick, inability to walk, cognitive barriers like mental challenges due to fetal alcoholic syndrome, and psychological barriers like too many expenses of failure, post-traumatic stress and depression, are some of the challenges teachers face every day when teaching Grade 12 mapwork classes in Vhembe District. Previously, learners with special intellectual, physical and emotional needs were largely left out from Geography mapwork curriculum. Hlaethwa (2013:11), posits that public schools are required by law to afford "*appropriate educational experiences*" for all learners, including learners with emotional, physical and academic challenges. To practice inclusive teaching strategy, the teachers can use dramatization in instances where learners acted out the stories they were taught. Teachers can also use cooperative learning for problem-solving activities and project teaching style, so that learners can work together in harmony. When teaching, the teacher can try to address the barriers arising from the classroom, in order to accommodate the different learning needs and different styles.

According to DoE (2009:35), the teacher can follow the following classroom ethos for inclusive teaching in his/her class; namely, establish mutual respect, encourage participation and provide decision making opportunities in the classroom. In the inclusive class, the teacher can use multi-level teaching as learners differ in terms of their level of ability. The teachers should also remember that there is no classroom where learners can learn in the same way, let alone at the same pace; hence, teachers should use various styles when teaching. When using inclusive teaching styles, the teacher can use learner-centred teaching styles. For most teachers, the most difficult aspect of inclusive education is that classes have a variety of learners with different abilities and different types of barriers to learning (Cohen, Fleming, Jay, Kroll, Ranby, Saunders & Van der Merve, 2014:2).

According to Cohen *et al.* (2014:2), the following are the practical suggestions for accommodating diversity in the classroom to teach inclusive class effectively: construct a safe working environment, compliment whenever possible and make constructive comments, make a positive atmosphere of mutual respect and trust in the classroom with ground rules, for example, learners laugh together, do not allow

mocking and intimidation, develop a “team” relationship between the learners, teachers, parents and anyone working towards the success of the learner, encourage learners to understand themselves better by chatting openly about different learning styles, strengths, challenges and weaknesses .

De Sousa and Nel (2008:48), posit that when planning a test, it is vital that learners with disabilities are taken into account and accommodated in inclusive teaching. Learners of disabilities can be accommodated during the times of instruction and in their assessment. When testing them, focus should be on the test and not on the disability of learners. For instance, learners with hearing incapacities can be given a written test and should not answer verbalised questions. Teachers can be sensitive to disabled learners’ needs and not humiliate them in the classroom. When giving disabled learners a test, it can be adjusted to suit them clearly. The teacher may read the instructions for each test section very slowly; read questions out loud, present the test in Braille and in large print, and rather simplify the language level. The teacher must also accommodate disabled learners by modifying the test timing by providing extra time when they write a test, allow extra breaks during testing and avoid time test (de Sousa & Nel, 2008:49).

2.6.2 Collaborative Teaching Strategy

Omoru and Nato (2014:228), assert that collaborative method includes learners sharing concepts in group and working together to resolve a challenge, for example, project method and fieldwork. Roche, Jordan and Conway (2007:45), add that collaboration is effectively applied when there is share problem solving where learners as a group will discover a mutual need, ascertain the challenge, recommend the results, assess ideas and plan facts together. In collaboration, teachers practice co-teaching where two teachers went to the same class and one will be teaching while the other playing supportive roles. Teaming and consulting also play a measure role in collaboration teaching. Geography mapwork teachers should collaborate with Mathematics and Physical Sciences teachers at schools, since mapwork consists of mathematical calculations which ordinary mapwork teachers cannot handle without the assistance of the Mathematics and Science teachers at school

The following are the strategies used in collaboration according to Roche *et al.* (2007:45):

- One teacher demonstrates and the other support.
- Substitute teaching, where class is divided into groups, any group will be given remedial help as it is identified as the one needing assistance.
- Parallel teaching where teachers teach two groups on identical content.
- Station teaching where curricular content is divided into two portions and one teacher teaches half of the content to half of the learners while the other teaches the other part to the rest of the learners. The group then switches the teachers to complete the lesson. Here the learners gain benefits of two teaching styles and different view-points. Kasimba (2008:161), opined that team-teaching should be invigorated amongst teachers of Geography mapwork, especially on aspects they are not knowledgeable with.

In collaboration, learners work in groups to elucidate problems. The learners can also share learning strategies from each other through social interactions. The key benefits of collaboration amongst learners are that peers become resources in the learning process and further promote collaborative philosophy. In collaborative learning, there is a connection amongst learners and they vigorously interchange ideas, critique each other's work and negotiate meaning together in an atmosphere of intellectual honesty.

2.6.3 Cooperative Learning Strategy

According to Jacobs *et al.* (2011:211), Cooperative learning is a method of teaching in which learners work together to safeguard that all members in their groups have learnt and integrated the same content. Kuş, Filiz and Altun (2014:313), assert that cooperative learning is a methodology in which learners help each other's learning by establishing small groups to achieve common objectives both in class and other places, boost self-reliance, develop their communication, problem solving, critical thinking skills and participate enthusiastically in teaching and learning process.

Roche *et al.* (2007:45), contend further that cooperative learning is a style of learning where two or five learners work together as a group of heterogeneous learners in a classroom. Cooperative learning is one of the most astonishing and luxuriant areas of model, research and practice in education (Kuş *et al.*, 2014:313). In the present researchers' view, cooperative learning is a way that teachers can teach in the classroom where learners are grouped together and work as a team to understand the learning in the same way.

According to Van Heerden (2008:27), and Kuş *et al.* (2014:312), co-operative learning enables learners to learn better, embrace optimistic approach to each other, to school, to teacher and the self-esteem improve and learners can contest to see who is the "best", they can work individualistically on their own or they can work obligingly with a keen interest in each other's learning. This is the best approach which is in line with theoretical framework of social constructivism. In cooperative learning, all group members are given the same opportunities to make relevant contributions within the assigned group. The importance of cooperative learning in an outcomes-based education (OBE) classroom cannot be over-emphasized (de Sousa & Nel, 2008:8). Cooperative learning is learner-driven and members are assessed as a group. The members usually assist each other in order to achieve common goals and usually collaborate as a group. The duty of the teacher in Cooperative learning is to facilitate, monitor, observes and teaches group skills.

The following are the characteristics of cooperative learning activities according to de Sousa and Nel (2008:9):

2.6.3.1 Face-to-face interaction

This necessitates group members to sit together as a group in a working environment so as to complete the allotted tasks.

2.6.3.2 Positive interdependence

The teacher can work towards constructing numerous interdependencies such as remuneration, resource task, and identity interdependence.

2.6.3.3 Individual accountability

Individual accountability denotes to the sentiment of each group participant that he/she is accountable for effecting the task on their own. The feeling of individual accountability can be established through assigning individual marks, individual tests, worksheets and puzzles and creating tasks that must be accomplished by the group while individual group members can be called upon to establish if each learner has attained the results.

2.6.3.4 Teaching social skills and processing group functioning

Teachers should teach positive group customs and develop necessary social skills so that learners can function commendably as a group member. Teacher should also teach the following societal skills, namely, forming skills, operational skills, formulating skills and agitating skills.

The following cooperative learning approaches should be used in mapwork as they comprise fundamentals of members functioning together in a group:

(a) Student Teams-Achievement Divisions (STAD)

Student Teams-Achievement Divisions (STAD) was established by Robert Slavin (Booyesen, 2015:21). In this method, the Geography teacher presents a lesson followed by learner study worksheet for four or five group (Jacobs *et al.*, 2011:201). Learners are separated into different groups consist of four members that are diverse in performance, masculinity, ethnicity and levels of achievement. The teacher presents a lesson and learners work in their respective groups and make sure that all the team members master the material (Booyesen, 2015:21). The learners take individual tests on the material at which they may not help their fellow team members. Learners scores are compared with their past records and the scores are totaled and points are conferred to form team scores and the team with the highest scores are confirmed winners in the classroom (Booyesen, 2011:21). STAD can be used with learners of all ages and in any subject and well suited to subjects such as mathematics and physical sciences. Since mapwork has a dosage of mathematics and physical sciences, STAD can also suites well in the teaching of Geography mapwork in South Africa.

(b) Team-Games-Teams (TGT)

These techniques of Cooperative learning is an active teaching strategy that is constantly used in Geography mapwork. (Booyesen, 2015:21). In Teams-Games-Teams (TGT), the learners are accorded in groups of four to five with equal ability, gender and level of academic performance like in STAD technique. The learners play educational games to master material and contest against the members of other teams. Winners in the different teams get points for their respective teams. When playing the teachers should make sure that individual learners are competing against each other in terms of their academic ability, hence, academic achievers against academic achievers and vice versa. The games are played on a weekly basis and each team has an opportunity of succeeding in the game played by teams.

(c) Jigsaw

According to Booyesen (2015:22), Jigsaw was developed by Elliot Aroson in 1979. In this learning style, learners are expected to work in six-member teams on resources of a particular topic, for example, calculating gradient on topographical map. Then the different teams present their information on calculating the gradient. Then participants from different teams with the same topic will meet in “expert” groups to study and help each other learn the topic given. The learners then return to their home teams and teach others what they have learned. This learning technique is suitable for teaching mapwork.

(d) Co-op Co-op strategy

The name Co-op Co-op emerges from that learners cooperate within small groups to harvest academic knowledge shared with the entire class. Co-op Co-op allows learners to work together in small groups so that they should share their understanding with their peers. Learners are assigned to four-to-five-member teams as in Student Teams Achievement Divisions (STAD).

The teachers’ role in co-op-co-op changes from standing in the front of the classroom doing most of the work to be a facilitator of learning process. During group work, the task of the teacher is to intervene when the group needs assistance in doing the work. The teacher becomes the most important figure in the class during cooperative learning and his role cannot be overemphasized. Learners are

the active role players in cooperative learning because cooperative learning follows social constructivism. Learners are assigned different roles in their groups to encourage positive interdependence. Learners are assigned roles as team leaders and scribes in their groups in order to empower them.

The following are the advantages of Cooperative learning in mapwork:

- Cooperative learning is a teaching approach that can be used in a variety of subjects and at all levels including in the teaching of Geography mapwork.
- Cooperative learning has the capability to harvest a level of ability and engagement that other forms of learning cannot.
- Booyesen (2015:23), advocates that cooperative learning benefits learners to learn respect for one another's' powers and restrictions, and also accept these differences.
- Cooperative learning nurtures positive interdependence amongst learners as it yields cross racial and cross-cultural friendships.
- Cooperative learning gives learners the opportunity to engage in discussions and take responsibility of their own learning.
- According to Booyesen (2015:22), cooperative learning advances learner performance as learners are remunerated in cooperative learning and due to the incentivized nature of cooperative learning, it is associated with achievements.

2.6.4 Fieldwork Teaching Style

Fieldwork is an educational visit to any place of importance by which the teacher wants to construct a learning opportunity for learners to get immediate information and experience in a real-life situation (Jacobs *et al.*, 2011:238). Mapwork also covers not only classroom activities but also outdoor activities. Therefore, field trips should also be used as a teaching strategy. Field-based teaching is provided in three stages, namely; planning phase which involves learners, fieldwork phase based on the skills of observation, data collection and recording by means of tasks and field sketches and post-fieldwork to interpret and evaluate the data harvested in the field. Fieldwork can lead to direct experience of map distance, angles of the

slope, height and directions as learners will experience real life issues. When walking outdoors, the learners can feel the slope angles, the distances they walk and the height above the sea level and the learners should be able to relate the topographical map to the ground surface.

Fieldwork is relevant to the teaching of geography mapwork because the concepts learned through fieldwork cannot be easily disremembered by learners as it comprises discovery learning to learners. Practically, it is also not easy to disremember what you saw in real life. However, according to DBE (2011a:11), Grade 12 learners can do fieldwork if time allows because of time and logistical limitations much of the fieldwork will need to be conducted outside the lesson time. This shows that the Department of Basic Education is deserting one of the teaching strategy needed to ignite and spark the learners' performance in mapwork. No wonder all the NSC Examination Diagnostic Reports for Geography from 2011 to 2016 has snubbed the importance of fieldwork in their general suggestions for improvement excluding the one in 2012.

In the general suggestions for improvement, NSC Examination Diagnostic Report for Geography (2012:84), it was suggested that teachers can use what is at their disposal to teach the learners, for example, go outside the class to show certain features and characteristics of features and taking learners on excursions would be a bonus. Maduane (2016:88), asserts that geography mapwork teaching is out-door context based. This means that geography should be a live subject and taught as such.

2.6.5 Discussion Teaching Strategy

According to Jacobs *et al.* (2011:187), discussion can be well-defined as a discourse between two or more people with certain purpose in view. When using discussion teaching style, teachers can take enough time to think carefully about the topic to discuss in mapwork such as calculating gradient on the orthophoto map. The teacher should also plan the discussion strategy to be used and define the roles to be played by both the teacher and learners. The teacher need to plan the discussion lesson in advance and should tell the learners about the intended objectives of the

discussion beforehand. Definite objectives help them to steer the discussion towards the desired end (Jacob *et al.*, 2011:187). The teachers' duty is to lead the discussion to the right direction and allowing learners to exercise their given authorities as group leaders and members.

When using discussion teaching style, learners gain knowledge, as they will be sharing different experiences with other different learners, thereby acquiring knowledge in an independent way. According to Jacobs *et al.* (2011:187), the discussion teaching style gives the teacher an opportunity to work with learners at two different levels simultaneously. The teacher assists the learners to grasp the mapwork topics and at the same time to discuss the mapwork topics without the aid of the teacher. This is the right teaching style for mapwork as learners will be able to discuss difficult topic like calculations and their steps without teachers' assistance. Discussion teaching style also develop the learners' insight and assist the learner in terms of effective communication skills needed in daily lives.

The following are the requirements for effective discussions according to Jacobs *et al.* (2011:188):

2.6.5.1 Meaningful topic

In order to guarantee active participation, discussion may originate from the topic that has been agreed upon by the teacher and the learners, for example, calculating area of rectangular features on the topographical map.

2.6.5.2 Full participation

A discussion may be conducted in such a way that all learners are given an opportunity to contribute fully (Jacobs *et al.*, 2011:188). When learners discussing, the teacher should give guidance and direction to the learners where necessary. Learners should be active speakers and attentive listeners when fully participating.

2.6.5.3 Self-expression

A discussion may allow learners to express their ideas freely (Jacobs *et al.*, 2011:189). The teacher should assist learners to express their personal points of view.

2.6.5.4 Leadership

In discussions a leader is appointed and is responsible for introducing topic to be discussed. The teacher may allow learners to take turns to lead the group. One of the main duties of leaders is to encourage participants to contribute, propel the discussion forward and to close the discussion.

2.6.5.5 Development of skills

All discussion learning styles may enable learners to develop various skills, such as the skill of introducing the topic, summarising, questioning and closing.

The following are the roles of the teacher during a discussion according to Jacobs *et al.* (2011:189), teachers are bound to be in the class with the learners during discussion, the teacher should make sure the classroom is conducive for a discussion learning style, the teacher may also introduce the topic to the whole class before dividing learners into small groups each with a leader, the teacher should also move from one group to the next during discussion to ensure that all learners participate in the discussion and make sure that learners respect one another. More importantly, the teacher may be a facilitator, advisor and a guidance to all groups.

2.6.6 Project-based Teaching Strategy

The project is a learner-centred activity done outside the class by learners and presented as real life. According to Jacobs *et al.* (2011:203), the project-based teaching style is an approach to learner-centred learning based on constructivist principles and has been popular for many years. In this teaching style, learners work individually or as a group gathering mapwork information on a certain topic and later present it to the teacher. In Geography, which is the theoretical part of mapwork, project is part of assessment task written by Grade 12 learners in term three. Project-based teaching style involves problem solving skills and investigation skills needed from learners. Doing projects also allows learners the opportunity to work independently from their teachers, thereby gaining independent learning skills. When applying the project teaching style, the teacher should plan the project. When planning a mapwork project, the teacher should include the following, namely; clearly defined objectives to be achieved, specific timeframes, relevant resources to be

used and where to access them, procedures to be followed, format of the project, expected mode of presentation and submission date (Jacobs *et al.*, 2011:204).

2.7 CONCLUSION

Findings from literature review indicate that there are problems learners experience when they study mapwork in Geography. These challenges confront teachers of Geography in the teaching of mapwork in Turkey, Nigeria and South Africa. There are school related variables, learner related variables and teacher related variables that impact the teaching of mapwork in South Africa. The literature has also revealed the importance of continued professional development of Geography mapwork teachers and the various teaching styles which are adopted by mapwork teachers in South Africa.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

This chapter provides the research design and methodology that were used in the study. This outline includes the research design, research methodology and sampling. This chapter also discusses measures of quality control that include trustworthiness of the study and validity and reliability of qualitative data and the data collection process of the study.

3.2 RESEARCH DESIGN

Research design is the blue print of the research study that precedes the real research process (Mouton, 2009:107). In this study, the researcher used the mixed-methods research design. According to Creswell (2010:123), the mixed-methods design is the type of research design that combines fundamentals of qualitative and quantitative approaches. A mixed-methods design is the type of research in which the researcher combines elements of qualitative and quantitative research approaches for the purposes of breadth and depth of understanding and corroboration (Creswell, 2010:123). Qualitative and quantitative approaches that was used in the study is delineated here under :

3.2.1 Qualitative Approach

The qualitative approach is a procedure of explanatory inquiry in which researchers make an interpretation of what they see, hear and understand (Creswell, 2009:176). The qualitative approach also emphasises the merits of units and meanings that are not experimentally examined in terms of quantity. Qualitative approaches also refer to meanings, characteristics and description of things (Leedy & Ormrod, 2005:89).

3.2.2 Quantitative Approach

The quantitative approach is an approach which is used to answer questions about relationships among measured variables with the purpose of explaining, forecasting and monitoring phenomena (Leedy & Ormrod, 2005:94). This is the kind of educational research in which the researcher decides what to study and asks specific narrow questions, collects numeric data from participants and analyze these numbers using statistics.

3.3 RESEARCH METHODOLOGY

Creswell (2009:18) defines research methodology as the different techniques, approaches and processes that are used in the process of employing research design. This section discusses both the qualitative and quantitative research methods.

The following was an outline of the methods that were used to collect data.

3.3.1 Qualitative Research Methods

Qualitative data was collected through the Interview Schedule. According to Bunting (2006:55), an interview schedule is an established protocol, usually written, detailing the procedures and questions to be asked in a structured interview. The researcher used the interview schedule as the interviewer can probe deeper into a response given by an interviewee and is useful for untangling complex topics.

3.3.2 Quantitative Research Methods

Quantitative data were accessed through questionnaires. Hesse-Biber (2010:102) defines a questionnaire as a written document that has a set of questions given to participants. The researcher opted to use a questionnaire because it best served the needs of this study as participants answered them according to their experience and opinions.

3.4 SAMPLING

This section involves the identification of population and the determination of sampling procedures and the sample.

3.4.1 Population

Population is a cluster of people with more characters that the researcher is interested in and from which a sample is drawn (Hanslam & McGarty, 2003:213). The population of the study were Heads of the Department of Geography, Geography teachers and Grade 12 Geography learners.

3.4.2 Sampling Procedures

Two sampling procedures were considered for this study , hence, qualitative sampling procedure and quantitative sampling procedure. The above mentioned sampling procedures are discussed below:

3.4.2.1 Qualitative sampling procedure

In the qualitative approach, purposive sampling was used to select the participants. Purposive sampling refers to the use of researchers' knowledge in order to meet the research objectives (Dattalo, 2008:6). The reason for using purposive sampling is that it enabled researchers to select a sample based on the purpose of the study and knowledge of the population. Participants are chosen due to the relevant knowledge they have.

3.4.2.2 Quantitative sampling procedure

For the quantitative approach, simple random sampling was used to collect the data. Simple random sampling is a method of selecting a sample from the population in such a way that every person could be selected by the researcher (Leedy & Ormrod, 2005:201). The researcher used simple random sampling because its sampling represented the target population and disregarded sampling bias.

3.4.3 Sample

According to Neuman (2006:219) a sample is an assemblage of a small number of elements taken from a bigger population. Two types of samples were considered for this study as follows; qualitative sample and quantitative sample as discussed below:

3.4.3.1 Qualitative sample

The Qualitative sample consisted of 5 Heads of Department and 5 teachers of Geography.

3.4.3.2 Quantitative sample

Quantitative data were collected from 150 learners through questionnaires.

3.5 INSTRUMENTATION

This section describes the instruments that were used to collect data. Two interview schedules were developed as instruments for data collection, namely; (i) Heads of departments understanding of challenges of teaching Geography mapwork inventory (See Appendix A). (ii) Teachers' challenges on teaching Geography mapwork inventory (See Appendix B). One questionnaire was developed as instrument to collect quantitative data, namely, learners experience on learning Geography mapwork inventory (See Appendix D).

3.5.1 Heads of Departments Understanding of Challenges of Teaching Geography Mapwork Inventory

Heads of departments understanding of challenges of teaching Geography mapwork inventory was used to solicit information on how Heads of department manages and understand challenges of teaching Geography mapwork in the classroom. The schedules encompassed two sections namely; (i) the biographical information and (ii) contextual questions. Biographical information exposed the following; gender, age in years, designation, highest educational qualification, professional qualification, teaching experience in years and experience as a head of department. Six contextual questions were used to collect information from Heads of

department on the following areas; challenges learners experience when learning Geography mapwork, encourage and motivate teachers to perform better in Geography mapwork, support mechanisms used to provide quality teaching of Geography mapwork, challenges experienced in managing teaching and learning, teaching strategies that can be adapted to enhance the teaching of Geography and kinds of learner-teacher support materials made available to teachers of Geography mapwork.

3.5.2 Teachers' Challenges on Teaching Geography Mapwork Inventory

Teachers' challenges on teaching Geography mapwork inventory was used to solicit information on challenges teachers face in teaching Geography mapwork. The schedule was divided into two sections. The first sections was used to collect participants' biographical information in terms of gender, age in years, designation, highest educational qualification, professional qualification and teaching experience in years. The second section was for contextual questions where six questions were posed to establish the following features; challenges experienced by learners when they learn mapwork in Geography, appropriate learning support materials of Geography mapwork, teaching Geography with understanding to learners, application of learner assessment as a learning tool and development of teaching skills and knowledge through in-service training workshops .

3.5.3 Learners Experience on Learning Geography Mapwork Inventory

Learners experience on learning Geography mapwork inventory was used to gather biographical and contextual information on learners experience when they learn Geography mapwork. Biographical information revealed participants' gender and age in years. Twenty items were used to seek information on the following aspects: contribution of class size to learners' performance, learners have Geography textbook, learners' attitudes contributes to learners performance in Geography mapwork, learners enjoy calculations in mapwork, learners enjoy teaching and learning of Geography, learners enjoy lessons on Geography mapwork, my teacher is competent to teach Geography mapwork, I am more involved in the practical aspects of Geography mapwork than theoretical parts of it, working in groups improves

learners' performance in Geography mapwork, learners have good background of Geography mapwork when they came to Grade 12, the foundation of learners in Geography mapwork affects learners' performance, the use of English as a language of learning and teaching impacts positively in learners' performance in Geography mapwork, learners' class attendance in Geography classroom affects their performance, learners are motivated to attend Geography mapwork at their school, there is a good relationship between the teacher and learners of Geography mapwork, there is classroom for teaching Geography mapwork at school, the teacher gives activities on Geography mapwork, there is Geography mapwork teacher at school, Geography mapwork calculations are difficult due to mathematical background and learners are able to interpret both topographical map and orthophoto map.

3.6 DATA COLLECTION PROCEDURES

In order to access the participants, permission was sought from the University of Venda Research Ethics Committees for Ethical Clearance Certificate and ethical considerations. Permission to conduct the research were also sought from the Department of Education Vhembe District, the circuit managers and school principals. The researcher delivered the consent forms to targeted schools, after obtaining permission from the school principals. An interview with heads of departments and teachers was arranged separately. Questionnaire with learners were controlled within a period of an hour in the learners' classrooms.

3.7 DATA ANALYSIS

According to McMillan and Schumacher (2006:364), data analysis is a continuing, recurring procedure that is incorporated into all stages of research. This is the process of bringing order, structure and meaning to the mass of collected data. Qualitative and quantitative data were analysed as follows:

3.7.1 Qualitative Data Analysis

Qualitative data were analysed thematically. Thematic analysis is a technique for identifying, analysing and reporting patterns (themes) within data (Braun & Clarke, 2006:79). The researcher used it because it is hypothetically flexible and capable of detecting and identifying factors and variables that influence any matter generated by the participants.

3.7.2 Quantitative Data Analysis

Quantitative data were analysed through the Statistical Package for Social Sciences. (SPSS) version 25. SPSS has a very powerful proprietary command syntax language to quickly perform and administer basic statistical analysis and particularly good with questionnaire data and also produces high quality data (Basturk, 2005:176).

3.8 CONCLUSION

The purpose of this chapter was to describe explain how data was collected and analysed. The research design and the research methodology were also discussed. The qualitative and quantitative research approaches were discussed. Research aspects such as the population, sample, sampling procedures were also highlighted. In addition, research instruments such as interview schedule and questionnaire were also highlighted.

CHAPTER 4

DATA ANALYSIS AND INTERPRETATION

4.1 INTRODUCTION

This chapter provides data analysis and interpretation. The qualitative data comprised of data collected from the 5 Heads of Departments of Geography and the 5 Geography teachers. The quantitative data were collected from 150 Geography learners who responded to the questionnaires. Qualitative data was analysed thematically. Quantitative data was analysed through the Statistical Package for Social Sciences (SPSS) Version 25 computer software.

4.2 ANALYSIS AND INTERPRETATION OF QUALITATIVE DATA: HEADS OF DEPARTMENTS' INTERVIEW

This section gives analysis and interpretation of all the data. Data were divided in terms of biographical and contextual information of the participants.

4.2.1 Biographical Information

The following is the biographical information analysis of the five heads of department of Geography as participants in the study:

Qualitative data were solicited from 5 heads of departments of which 3 were males and 2 were females. Their years ranged from 40 to 47. Their highest educational qualification ranged from honours to masters degree. Their professional qualification ranged from diploma to Post Graduate Diploma in Education. Their teaching experience ranged from 11 to 26 years. Their experience as HOD was from 8 to 9 years.

4.2.2 Contextual Analysis and Interpretation

This section presents contextual analysis and interpretation of data pertaining to heads of departments' responses to the interview questions. All responses were converted into themes. All five heads of departments at secondary schools in Nzhelele West Circuit responded to all five interview questions analysed below:

4.2.2.1 What are the challenges learners experience when they learn Geography mapwork?

The Heads of departments indicated that lack of the basic foundation, prior knowledge and attitudes of learners, are the most important challenges faced by learners when they learn Geography mapwork. They also indicated that the interpretation of topographical and orthophoto maps is a very serious challenge to learners. The following are extracts of what the HOD's said:

HOD1: *"The most important challenge to learners is understand the interpretations of topographical maps and orthophoto maps"* (See Appendix E, line 7).

HOD2: *"I have realised that learners lack the basic foundation of Geography mapwork they should have studied in the senior phase"* (See Appendix E, line 8).

The findings from the literature indicate that learners even fail to make their own notes as expected of them, due to their negative attitude towards Geography mapwork and lack of a solid foundation in the lower grades (Van Heerden, 2008:10). This implies that if learners fail to master the foundation from the lower grades, it will be difficult for them to perform optimally in geography mapwork.

4.2.2.2 How do you encourage and motivate teachers to perform well in Geography mapwork?

The Geography mapwork departmental heads indicated that this is achieved by giving them incentives for excellent teaching and other awards after performing well, encouraging them to work very hard, by praising them and encouraging them to attend workshops. Others indicated that they use incentives such as certificates of good performance and money to encourage and motivate teachers to perform better

in geography mapwork. Some of the departmental heads said the following when interviewed:

HOD1: *“I usually encourage geography teachers by awarding for excellent teaching”* (See Appendix E, line 14).

HOD2: *“I also encourage teachers to attend Geography mapwork course and workshops organised by the department and the school”* (See Appendix E, line 20).

HOD3: *“I encourage them by awarding best Geography mapwork teachers, by praising them giving them certificates and also invite motivators for them to come and encourage them”* (See Appendix E, line 14).

The literature revealed that due to on-going professional development in Geography mapwork, teachers attain the most recent and relevant knowledge of the subject matter, thereby connecting the weakness of teachers (Hirsch, 2009:12). This implies that one strategy for encouraging and motivating teachers to perform well in Geography mapwork is through the attendance of cluster meetings and workshops, to obtain all assessment requirements to perform optimally.

4.2.2.3 What support mechanisms do you use to provide quality teaching of Geography mapwork?

Heads of department indicated that they did so by giving teachers continued professional development in Geography mapwork, encouraging teachers to set their assessments in terms of Bloom's taxonomy, monitoring teachers' content coverage and giving learners more written tasks. This thinking was supported by the heads of department who said that:

HOD1: *“As the HOD, I foster high quality teaching by giving teachers professional development support through training and encourage them to adhere to 2018 annual assessment programme crafted by Vhembe District and the one by the school”* (See Appendix E , line 33).

HOD2: *“I also encourage teachers to give more formal and informal tasks to learners to lay the foundation of formal tests and examinations, thereby encourage them to also set their tests according to Bloom's taxonomy”* (See Appendix E, line 41).

The literature showed that under-achieving teachers should be developed at school level by departmental heads and curriculum advisors (Serrao, 2009:6). This implies that teachers should be supported and developed continually to provide quality teaching as teacher development is the cornerstone of professional competence in geography mapwork curriculum.

4.2.2.4 What are the challenges that you experience in managing teaching and learning and does this apply to teaching of Geography?

Most of the departmental heads indicated that overcrowded classes, negative attitudes towards mapwork, lack of learner-teacher support materials like local maps, are the common challenges they experience in managing teaching and learning .Departmental heads further indicated that teachers do not want to teach Geography mapwork, which is paper 2 and carries 75 marks, and said that learners are too lazy and do not have any interest in mathematical calculations. Others stated that most Geography mapwork teachers have challenges themselves, as they are not trained to teach Geography mapwork itself, hence, they skip topics like mathematical calculations. This ultimately makes learners perform poorly. Departmental heads concurred with this view by saying that:

HOD1: *“There is also the challenge of negative attitude of teachers when teaching Geography Mapwork for example, teaching of calculations”* (See Appendix E, line 51).

HOD4: *“There are so many challenges but I’ll first site a few related to our school, for instance, there are many learners and classes are overcrowded and that poses a big challenge to geography teachers”* (Appendix E, line 63).

The literature revealed the challenges that departmental heads encounter in managing teaching and learning in Geography mapwork and include constant changes in Geography mapwork curriculum and traditional approaches to teaching Geography mapwork (Jacobs *et al.*, 2011:163). This implies that challenges experienced by departmental heads are real and must be dealt with to manage Geography mapwork effectively.

4.2.2.5 What are the teaching strategies that can be adopted to enhance the teaching of Geography?

Geography mapwork departmental heads indicated that co-operative learning strategy, project-based teaching strategy, discussion teaching strategy, fieldwork teaching style and inclusive teaching strategy are learner-centred teaching strategies that can be adopted to enhance the teaching of geography. Others indicated that collaborative teaching strategy as a learner-centred strategy can also be adopted to enhance the teaching of geography mapwork. Some departmental heads said the following when interviewed:

HOD1: *“Co-operative learning strategy is one of the strategy that can be used to enhance the teaching of geography”* (See Appendix E, line 72).

HOD2: *“Field work is also a good teaching strategy as mapwork also include Geomorphology and learners are able to learn real things like flat and steep areas and this is where learners learn through laying of hands on mapwork features”* (See Appendix E, line 53).

The literature indicated that the birth of OBE in South Africa’s education system led to social constructivist approach to teaching, which is learner-centred and upheld active participation from learners. Therefore, the most common teaching strategies for participants were co-operative learning, field work and inclusive teaching (Van Heerden, 2008:27). This implies that learner-centred teaching strategies should be used to teach Geography mapwork, as they are in line with South Africa’s education system, which is outcomes based.

4.2.2.6 What kinds of learner-teacher support materials are made available to teachers of geography Mapwork?

Almost all departmental heads indicated that topographical maps, Geography mapwork textbooks, study guides, protractors, calculators and rulers are made available to teachers of Geography mapwork, so as to improve their results. The head of department concurred with this view, as follows:

HOD1: *“I think the following are the learner-teacher support materials which are made available to teachers, topographical maps, orthophoto maps, protractors, textbooks, magnetic compass, atlases and pencils”* (See Appendix E, line 101).

The literature revealed some of the materials made available to teach Geography mapwork are geographical positioning systems devise, Goggle Earth, computers, laptop, GIS softwares, aerial photographs, synoptic weather charts and cameras (DBE, 2010:8). This implies that basic learner-teacher support materials such as maps, protractors and rulers are available in schools.

4.3 ANALYSIS AND INTERPRETATION OF QUALITATIVE DATA: TEACHERS' INTERVIEW

4.3.1 Biographical Information

The following is the biographical information analysis of the 5 teachers of Geography mapwork as participants in the study.

Qualitative data were solicited from 5 teachers of Geography mapwork which were all males. Their years ranged from 39 to 49. Their highest educational qualifications ranged from honours to masters degree. Their professional qualification ranged from Diplomas to Honours. Their teaching experience ranged from 10 to 28 years.

4.3.2 Contextual Analysis and Interpretation

This section presents contextual analysis and interpretation of data pertaining to Geography teachers' responses to the interview questions. All the responses were converted into themes. All five Geography teachers at the secondary schools in Nzhelele West Circuit responded to all five interview questions analysed below:

4.3.2.1 What do you think are the challenges experienced by learners when learning mapwork in Geography?

The majority of the participants indicated that the learners' have language use which is Tshivenda, is a serious barrier for learners when they learn mapwork. Others revealed that learners' absenteeism and lack of prior knowledge is a challenge. One teacher has this to say:

T5: *“Learners don’t understand the language of Geography mapwork used by teachers, which is always in English and this is a challenge for learners”* (See Appendix F, line 115).

The reviewed literature revealed that Grade 12 learners are struggling to talk in English and that could be challenging them (Rammala, 2009:21). This implies that there is a thoughtful challenge regarding English as a medium of instruction for Geography mapwork learners.

4.3.2.2 What are the challenges that you face when teaching mapwork?

Most of the teachers indicated that overcrowded classrooms is a major challenge facing them when teaching geography mapwork. Three (3) teachers supported this view as follows:

T2: *“Overcrowding in Geography mapwork class is also a challenge because I have 59 learners in grade 12b, yet learner-teacher ratio recommended by the department of education is 1: 35”* (See Appendix F, line 123).

T3: *“Yeah, as a Geography teacher, one of my challenge is that my class is overcrowded, and I am unable to manage and control that class”* (See Appendix F, line 126).

T4: *Classes are overcrowded and in my class I have 52 learners”* (See Appendix F, line 128).

The Geography mapwork teachers indicated that broad content, overcrowded classes and shortage of maps are the most important challenges that confront them when teaching mapwork. The study findings concur with the literature. Literature made reference to many challenges that teachers face when they teach mapwork such as the dearth of learner-teacher support materials (Rammala, 2009:23). This implies that teachers encounter many challenges in the learning and teaching of Geography mapwork, such as overcrowded classes.

4.3.2.3 What would you regard as appropriate learning support material for Geography mapwork?

All teachers believed that textbooks, calculators, maps, rulers and rubbers are appropriate materials for teaching Geography mapwork. Some of the teachers said the following :

T2: *“Appropriate mapwork learning materials are mapwork textbooks, mapwork study guides as they simplify concepts, learning channels, topographical maps, orthophoto maps, atlases, protractors for measuring time bearing and pencils”* (See Appendix F, line 128).

T4: *“To me, both topographical maps and orthophoto maps should be provided to learners, mapwork textbooks, pair of stereoscope, calculators, protractors, strings, 200 metres measuring tapes, appropriate tables and chairs for putting maps are regarded as appropriate learning support materials of Geography mapwork* (See Appendix F, line 145).

Some of the materials used to teach Geography mapwork are Geographic Positioning Systems (GPS) satellite photographs, cameras, goggle earth computers and felt-tip pens (Maduane, 2016:75). This implies that learner support materials help both teachers and learners master Geography mapwork curriculum, and this improves learners' performance. The implication is that there are appropriate learning support material of Geography, such as protractors, calculators and satellite images.

4.3.2.4 In what ways would geography mapwork be taught with understanding to learners?

Almost all the teachers indicated that there are ways in which Geography mapwork should be taught with understanding to learners; for example, exposing them to more practical work using learner-centred teaching strategies like inclusive teaching Cooperative teaching and collaborative teaching strategies. This is what some of teachers had to say:

T1: *“Mm, learners should be exposed to more practical work, for example, give them more problems to solve, engage them in groups, when you give them questions about map interpretations and GIS”* (See Appendix F, line 150).

T2: *“Learners should also be taught mapwork using learners-centred teaching strategies such as inclusive teaching where academically challenged learners are accommodated during teaching lessons”* (See Appendix F, lines 153).

T3: *“The best way is to teach learners mapwork terminology like oblique and vertical aerial photographs and scale, using learner-centred strategies like co-operative teaching where learners are divided into groups of either three to five”* (See Appendix, F line 155).

T4: *“Co-operative learning is the best way to teach learners because learners are able to share their ideas and assist each other”* (See Appendix F, line 162).

T5: *“Perhaps you put them into smaller groups and working groups and monitor them as a teacher”* (See Appendix F, line 163).

The literature revealed that in cooperative learning, learners are alienated into diverse groups, four members of mixed ability, masculinity and levels of achievement (Booyesen, 2015:21). This implies that teachers should use learner-centred teaching strategies such as cooperative learning to teach mapwork with understanding.

4. 3.2.5 How do you apply learner assessment as a tool?

All the teachers indicated that they give learners classwork and homework as informal assessment and monthly tests and examinations as formal assessments. The following are some of the examples of what the teachers said:

T2: *“Learners are given more practical informal assessment in the form of homework and classwork every time mapwork is taught”* (See Appendix F, line 173).

T5: *“Perhaps I give learners class activities, some homework activities, some fortnightly test, monthly tests, quarterly tests and exams which are coming from the department of education”* (See appendix F lines 181).

The literature showed that assessment can either be formal or informal and examples of formal assessments are tests and examinations, the results of which are to be used to gauge the learners’ performance in geography mapwork (DBE, 2011:3). This implies that learners should be given both formal and informal assessment when teaching Geography mapwork.

4. 3.2.6 How would in-service training workshops develop your teaching skills and subject knowledge?

Almost all the teachers indicated that attendance of workshops conducted by curriculum advisors who are expert teachers helps them gain more teaching skills, new teaching strategies and guides them on how to attend to certain mapwork concepts. Others indicated that they share mapwork skills and techniques with other teachers during in-service training workshops, to enrich them with more content knowledge. This is what some of the teachers had to say:

T1: *“Teachers are also like cars, they have to be serviced, in this way they have to be familiarised with new documents, the manner in which they have to teach or method of teaching”* (See Appendix F, line 185).

T2: *“This in-service workshops are conducted by geography mapwork specialists and they guide me on how to attend to certain mapwork concepts such as intervisibility and train me to use more learners-centred teaching strategies such as co-operative teaching”* (See Appendix F, line 188).

T5: *“As a teacher, I get updated and well informed with current curriculum changes”* (see appendix F, line 194).

The Findings from literature indicated that teachers themselves are lifelong learners and must remain learners throughout their entire career, harvesting new skills, approaches and teaching strategies to ensure better teaching of geography mapwork (Jansen, 2011:6). This implies that in-service training workshops indeed develop teaching skills and geography mapwork knowledge.

4.4 ANALYSIS AND INTERPRETATION OF QUANTITATIVE DATA: LEARNERS’ QUESTIONNAIRE

Analysis and interpretation of quantitative data were analysed from questionnaires completed by learners. The questionnaires were divided into biographical and contextual information .

4.4.1 Biographical Information for Learners

This section discusses gender and age of the participants .

Data was collected from 150 learners who completed questionnaires. Table 4.1 shows that 56.7% (85) of the learners were males, while 43.3% (65) were females. The data also indicates that there were more males than females completing the questionnaire. This implies that these categories have more males than females doing Geography mapwork in Grade 12. From Table 4.1 it can be noted that 46.7% (70) of the learners were aged between 17 and 19 years. Also, 42.7% (64) of learners were between 20 and 22 years of age, while 10.7% (16) were at 23 and above years. This means that majority of the learners started their primary school at the right age and were doing Grade 12 at the right age. The age distribution also

revealed that the 17 -19 years age cohort is the accepted age for learners to do Grade 12 in South African schools.

Table 4.1: Biographical Information for Learners

4.4.1.1	Gender	Frequency	Percentage
	Male	85	56.7
	Female	65	43.3
	Total	150	100
4.4.1.2	Age Group		
	17-19	70	46.7
	20-22	64	42.7
	23 and above	16	10.7
	Total	150	100

4.4.2 Contextual Analysis and Interpretation of Data Solicited from Learners

This section presents an analysis and interpretation of contextual information solicited from Grade 12 learners.

4.4.2.1 The class size contributes to the performance of learners in Geography mapwork

Table 4.2: Contribution of Class Size to Learner Performance

	Frequency	Percentage
Strongly Agree	52	34.7
Agree	75	50.0
Neutral	0	0
Disagree	18	12.0
Strongly Disagree	5	3.3
Total	150	100

According to Table 4.2, 50% (75) of learners agreed that class size contributes to the performance in Geography mapwork and 34.7% (52) of the learners strongly agreed with the statement. Another 12.0% (18) of the learners disagreed, while only 3.3% (5) strongly disagreed. The majority of the learners 84.7% (127) agreed with the statement that class size contributes to the performance of learners in Geography mapwork. The literature findings reveal that in large classes teachers are unable to give each learner individual attention (Jacobs *et al.*, 2011:181). This implies that class size contributes to the performance of learners in geography mapwork.

4.4.2.2 I do have a geography mapwork textbook

Table 4.3: Availability of Textbooks

	Frequency	Percentage
Strongly Agree	43	28.7
Agree	17	11.3
Neutral	3	2.0
Disagree	36	24.0
Strongly Disagree	51	34.0
Total	150	100

Table 4.3 shows that 34.0% (51) of the learners strongly disagreed that they have a Geography mapwork textbook, while 24.0% (36) disagreed that they have a Geography mapwork textbook. The table further noted that 28.7% (43) strongly agreed while 11.3% (17) agreed. This response implies that the majority 58% (87) of the learners disagreed with the statement that they have a Geography mapwork textbook. The findings of the literature reveal that there is a shortage of textbooks in Grade 8-12 in 19 schools in Vhembe District and a shortage of stationery in 28 secondary schools. This was established during provincial monitoring in Limpopo Province (Limpopo DoE, 2010:8).

4.4.2.3 Learners' attitudes contribute to learner performance in Geography mapwork

Table 4.4: Contribution of Learners' Attitudes

	Frequency	Percentage
Strongly Agree	53	35.3
Agree	75	50.0
Neutral	6	4.0
Disagree	15	10.0
Strongly Disagree	1	.7
Total	150	100

Table 4.4 shows that 50.0% (75) of the learners agreed that learners' attitudes contribute to learners' performance in Geography mapwork while 35.3% (53) strongly agreed with this statement. Another 10.0% (15) disagreed and .7% (1) strongly disagreed, while 4.0% (6) of the learners remained neutral. The responses imply that the majority 85.3% (128) of the learners agree with the statement that their attitudes contributes either negatively or positively towards the learning of Geography mapwork. The findings from the literature reveal that Geography mapwork learners should have a sense of value to participate in the subject and if the sense of value is not obtained, it becomes a barrier for the learner to succeed in learning Geography mapwork (Maduane, 2016:83). These findings correlate with the view that learners' attitudes contributes to learner performance in geography mapwork.

4.4.2.4 I enjoy calculations in Geography mapwork

Table 4.5: Learners Enjoy Calculations

	Frequency	Percentage
Strongly Agree	28	18.7
Agree	17	11.3
Neutral	0	0
Disagree	42	28.0
Strongly Disagree	63	42
Total	150	100

Table 4.5 indicates that 42% (63) of learners strongly disagreed that they enjoy the calculations in Geography mapwork; 28% (42) disagree with this statement while 18.7% (28) strongly agreed and 11.3% (17) agreed. The implication is that the majority 70.0% (105) of the learners disagreed with the statement, that they enjoy calculations when they are taught by Geography mapwork teachers. These findings correlate with literature, which revealed that there is poor performance of learners in geography mapwork, especially in calculations (NSC Examination Diagnostic Report for Geography, 2015:79).

4.4.2.5 I enjoy learning of Geography mapwork

Table 4.6: Learners Enjoy Learning

	Frequency	Percentage
Strongly Agree	42	28.0
Agree	75	50.0
Neutral	1	.7
Disagree	22	14.7
Strongly Disagree	10	6.7
Total	150	100

Table 4.6 shows that 50.0% (75) of the learners agreed and 28% (42) Strongly Agreed that they enjoy teaching and learning of Geography mapwork. The table further indicated that 14.7% (22) disagreed, while 6.7% (10) strongly disagreed that they enjoy teaching and learning of geography mapwork. Lastly, .7% (1) were neutral. The responses from this data imply that majority 78% (117) of the learners agreed that they enjoy teaching and learning of Geography mapwork. If the attitudes of learners towards Geography mapwork is positive the learners will enjoy teaching and learning, and they will score higher marks (Rammala, 2009:19). These findings do not correlate with the literature as it revealed that there is lack of learners' interest in Geography mapwork due to a dose of Physics and Maths.

4.4.2.6 I enjoy lessons on geography mapwork

Table 4.7: Learners Enjoy Lessons on Geography Mapwork

	Frequency	Percentage
Strongly Agree	52	34.7
Agree	75	50.0
Neutral	0	0
Disagree	18	12.0
Strongly Disagree	5	3.3
Total	150	100

Table 4.7 indicates that 50.0% (75) of the learners agreed that they enjoy lessons on geography mapwork, 34.7% (52) strongly agreed, while 12.5% (18) disagreed and 3.3% (5) strongly disagreed. The responses imply that majority 84.7% (127) of the learners agreed that they enjoy lessons on Geography mapwork. Learners who enjoys mathematical calculations in Geography mapwork will also perform better as compared to those learners who dislike it (Rilwani *et al.*, 2014:34).

4.4.2.7 My teacher is competent to teach Geography mapwork

Table 4.8: Competency of Teachers

	Frequency	Percentage
Strongly Agree	49	32.7
Agree	49	32.7
Neutral	3	2.0
Disagree	23	15.3
Strongly Disagree	25	16.7
Total	150	100

Table 4.8 shows that 32.7% (49) strongly agreed that their teachers are competent to teach Geography mapwork, 32.7% (49) agreed with this statement, while 16.7% (25) strongly disagreed and 15.3% (23) disagreed. Meanwhile 2.0% (3) were neutral. The implication is that the majority 65.4% (98) of the learners agreed with the statement that the teacher is capable to teach Geography mapwork. The responses also imply that the understanding of learners' content of Geography mapwork is determined by the teachers' content knowledge, competency and skills. There are significant differences in learners' performance in Geography mapwork on the basis of teachers' qualifications and experience (Adeyemi, 2008:203).

4.4.2.8 I am more involved in the practical aspects of Geography mapwork than theoretical parts of it

Table 4.9: Practical Work

	Frequency	Percentage
Strongly Agree	38	25.3
Agree	51	34.0
Neutral	7	4.7
Disagree	39	26.0
Strongly Disagree	15	10.0
Total	150	100

From Table 4.9, it shows that 34.0% (51) of the learners agreed they are more involved in the practical aspects of Geography mapwork than theoretical parts of it, while 25.3% (38) strongly agreed with the statement. The table further shows that 26.0% (39) disagreed, 10.0% (15) strongly disagreed and 4.7% (7) were neutral. The data reflect that the majority 59.3% (89) of the learners agreed they are more involved in the practical work of Geography mapwork. This implies that practical work makes learners solve problems with ease in Geography mapwork. Geography mapwork teaching is out-door context-based and should be taught as such (Maduane, 2016:88).

4.4.2.9 Working in groups improves learners' performance in Geography mapwork

Table 4.10: Working in Groups

	Frequency	Percentage
Strongly Agree	75	50.0
Agree	63	42.0
Neutral	2	1.3
Disagree	9	6.0
Strongly Disagree	1	.7
Total	150	100

Table 4.10 shows that 50.0% (75) of the learners strongly agreed that working in groups improved learners' performance in Geography mapwork, 42.0% (63) agreed, 6.0% (9) disagreed, .7% (1) strongly disagreed while 1.3% (2) remained neutral. The data imply that majority of the learners understand further when they work in groups and really improves their performance. Working in group , for example, using cooperative learning strategy, helps learners to improve their learning abilities and communication skills. Cooperative learning is one of the best learning strategy. It is learner-centred and learners work in groups of three to five (Van Heerden, 2008:27). The implication is that the majority 92% (138) of the learners agreed with the statement that working in groups improves learners' performance in Geography mapwork.

4.4.2.10 I had a good background knowledge of Geography mapwork when I came to Grade 12

Table 4.11: More Background of Geography Mapwork

	Frequency	Percentage
Strongly Agree	16	11.0
Agree	15	10.0
Neutral	0	0
Disagree	56	37.2
Strongly Disagree	63	41.8
Total	150	100

Table 4.11 indicates that 41.8% (63) of the learners strongly disagreed that they a good background of Geography mapwork when they came to Grade 12, 37.2% (56) disagreed, while 11.0% (16) strongly agreed and 10.0% agreed. According to the data presented, no learner was neutral. The responses imply that the majority 79% (119) of learners disagreed with the statement that they had a good background knowledge of Geography mapwork when they came to Grade 12 class. This may also means that learners were not taught the basics of Geography mapwork from senior phase (Grade 7, 8 and 9) and FET (Grade 10 and 11) phase. Findings from literature indicate that learners poorly perform in Geography mapwork because deficiency of basic skills to reading and simple mathematical skills (Mwenesongole, 2016:530).

4.4.2.11 The foundation of learners in Geography mapwork affects learners' performance

Table 4.12: Foundation of Learners

	Frequency	Percentage
Strongly Agree	39	26.0
Agree	61	40.7
Neutral	8	5.3
Disagree	22	14.7
Strongly Disagree	20	13.3
Total	150	100

Table 4.12 shows that 40.7% (61) agreed that the foundation of learners in Geography mapwork affects learners' performance; 26.0% (39) strongly agreed while 14.7% (22) disagreed and 13.3% (20) disagreed. Only 5.3% (8) were neutral in terms of the data collected from learners. The responses imply that the majority 66.7% (100) agreed with the statement that the foundation of learners in Geography mapwork affects learners' performance. There is a poor foundation of Geography mapwork amongst Grade 12 learners that affects them negatively (Maduane, 2016:144).

4.4.2.12 Using English as a language of learning and teaching impacts positively in learners' performance in Geography mapwork

Table 4.13: The use of English in Teaching and Learning

	Frequency	Percentage
Strongly Agree	54	36.0
Agree	65	43.3
Neutral	7	4,7
Disagree	17	11.3
Strongly Disagree	7	4.7
Total	150	100

Table 4.13 shows that 43.3% (65) of the learners agreed that using English as a language of teaching and learning impacts positively on learners' performance in Geography mapwork, 36.0% (54) strongly agreed, 11.3% (17) disagreed and 4.7% strongly disagreed. However, 4.7% of the learners were neutral. This response implies that majority 79.3% (119) of the learners agreed with the statement that using English as a language of teaching and learning impact positively in learners' performance in Geography mapwork. These findings do not correlate with the literature reviewed as it revealed that most of the Grade 12 learners are struggling to speak in English and thus could be the reason why learners are failing, since English is the language used to answer examination papers (Rammala, 2009:21). This means that learners who use English during their learning process have a better chance to pass Geography mapwork than those who use their mother tongue.

4.4.2.13 Learners' class attendance in Geography mapwork classroom affects learners' performance

Table 4.14: Learners' Class Attendance

	Frequency	Percentage
Strongly Agree	63	42.0
Agree	40	26.7
Neutral	0	0
Disagree	28	18.7
Strongly Disagree	19	12.7
Total	150	100

Table 4.14 shows that 42.0% (63) of learners strongly agreed that learners' class attendance in geography mapwork classroom affects learners' performance, 26.7% agreed, 18.7% disagreed and 12.7% strongly agreed while there was no learner who remained neutral. The data implies that majority 68.7% (103) of the learners agreed that that class attendance in Geography mapwork classroom affects learners' performance. Learner truancy is one of the precursor to academic performance since learners miss school, they do not learn and ultimately they fail the grade (Mboweni, 2014:3). This also imply that learner class attendance may positively or negatively affect performance of learners in Geography mapwork

4.4.2.14 Learners are motivated to attend Geography mapwork lessons at school

Table 4.15: Motivation of Learners

	Frequency	Percentage
Strongly Agree	39	26.0
Agree	64	42.7
Neutral	6	4.0
Disagree	20	13.3
Strongly Disagree	21	14.0
Total	150	100

Table 4.15 shows that 42.7% (64) of learners agreed that they are motivated to attend Geography mapwork lessons at their schools, while 26.0% (39) strongly agreed. It further depicts that 13.3% (20) of the learners disagreed that they are motivated to attend Geography mapwork lessons at schools, 14.0% (21) strongly agreed while 4.0% were neutral. The data implies that majority 68.7% (103) of the learners agreed that they are motivated to attend Geography mapwork lessons in their schools. The learner should have a sense of value to participate in Geography mapwork and if the value is not obtained, it becomes a barrier for the learner to carry on learning Geography mapwork (Maduane, 2016:83).

4.4.2.15 There is a good relationship between the teacher and learners of Geography mapwork

Table 4.16: Good Relationships between Teachers and Learners

	Frequency	Percentage
Strongly Agree	49	29.3
Agree	62	40.7
Neutral	0	0
Disagree	19	12.7
Strongly Disagree	26	17.3
Total	150	100

Table 4.16 also shows that 40.7% (62) of the learners agreed that there is a good relationship between the teacher and learners of Geography mapwork and 29.3% (49) strongly agreed that there is a good relationship between the teacher and learners of Geography mapwork. It further shows that 17.3% (26) of the learners strongly agreed that there is a good relationship between the teacher and learners of Geography, while 12.7% (19) disagreed with this statement. However, no learner was neutral. This response implies that the majority 69.7% (111) of the learners agreed with the statement that there is a good relationship between the learners and Geography learners in schools and this contribute to good performance of the subject. In order to have good Geography mapwork results, there must be a good relationship between the teacher and learners in class (Ozdemir, 2012:340).

4.4.2.16 There is a classroom for teaching Geography mapwork at school

Table 4.17: Availability of Classrooms

	Frequency	Percentage
Strongly Agree	25	16.7
Agree	36	24.0
Neutral	0	0
Disagree	42	28.0
Strongly Disagree	47	31.3
Total	150	100

Table 4.17 also shows that 31.3% (47) of the learners strongly disagreed that there is a classroom for teaching Geography mapwork at school, 28.0% (42) agreed, while 24.0% (36) agreed and 16.7% (25) strongly agreed with zero percent neutral. The implication from the responses is that majority 59.3% (89) disagreed with the statement that there is a classroom for teaching Geography mapwork at school. The provincial report on monitoring schools and readiness in January 2010 revealed that there was lack of adequate number of classrooms in 29 secondary schools in Vhembe District (Limpopo DBE, 2010:11). In most schools' sciences stream learners' moves to a general stream class to attend Geography mapwork subject of vice versa, hence, shortage of Geography mapwork classrooms.

4.4.2.17 The teacher gives us activities on Geography mapwork

Table 4.18: Giving Learners Activities

	Frequency	Percentage
Strongly Agree	58	38.7
Agree	36	24.0
Neutral	4	2.7
Disagree	20	13.3
Strongly Disagree	32	21.3
Total	150	100

Table 4.18 shows that 38.7% (58) of learners strongly agreed that they are given Geography mapwork activities by their teachers, 24.0% (36) agreed while 21.3% (32) strongly disagreed and 13.3% (20) disagreed. It further depicts that only 2.7% (4) of the learners remained neutral. This response implies that majority 62.7% (94) of learners agreed with the statement that teachers give them activities on Geography mapwork. Giving learners more activities improves learners' performance (Okwilagwe, 2012:98). These activities improve learners' performance in Geography mapwork.

4.4.2.18 There is a Geography mapwork teacher at our school

Table 4.19: Availability of Geography Mapwork Teachers

	Frequency	Percentage
Strongly Agree	44	29.3
Agree	61	40.7
Neutral	0	0
Disagree	19	12.7
Strongly Disagree	26	17.3
Total	150	100

Table 4.19 shows that 40.7% (61) agreed that there is a Geography teacher in their schools, while 29.3% (44) strongly agreed with the statement. The table further shows that 17.3% (26) strongly agreed, and 12.7% (19) disagreed with the statement, no learner was neutral. The data shows that the majority 70% (105) agreed with the statement that there is a Geography teacher in their schools. These findings do not correlate with the literature, as it revealed that majority of the public schools are served with unqualified teachers because Geography teachers are difficult to come by (Adeboye, 2015:22).

4.4.2.19 Geography mapwork calculations are difficult due to their mathematical background

Table 4.20: Difficulty of Mapwork Calculations

	Frequency	Percentage
Strongly Agree	48	32.0
Agree	44	29.3
Neutral	0	0.0
Disagree	36	24.0
Strongly Disagree	22	14.7
Total	150	100

Table 4.20 further shows that 32.0% (48) of the learners strongly agreed that mapwork calculations are difficult due to mathematical background while 29.3% (44) agreed with the statement. The table further depicts that 24.0% (36) disagreed that mapwork calculations are difficult due to mapwork background while 14.7% (22) of the learners strongly disagreed with the statement. The implications from the responses is that majority 61.3% (92) of learners agreed with the statement that mapwork calculations are difficult due to mathematical background. The majority of learners have quantitative challenges and Geography mapwork deals with quantitative reasoning and mathematical skills learners are always petrified of it (Amosun, 2016:45).

4.4.2.20 Learners are able to interpret both topographical map and orthophoto map

Table 4.21: Learners' Interpretation of Maps

	Frequency	Percentage
Strongly Agree	31	20.7
Agree	18	12.0
Neutral	0	0
Disagree	46	30.7
Strongly Disagree	55	36.6
Total	150	100

Table 4.21 also shows that 36.6% (55) of the learners strongly disagreed that learners are able to interpret both topographical map and orthophoto map, while 30.7% (46) disagreed with the statement. The table further depicts that 20.7% (31) of the learners strongly agreed, while 12.0% (18) agreed with the statement that learners are able to interpret both topographical and orthophoto maps. No learner was neutral. The data shows that the majority 67.3% (101) of the learners disagreed with the statement that learners are able to interpret both topographic map and orthophoto map which is a prerequisite in geography mapwork. The common errors and misconceptions identified in the NSC Examination Diagnostic Report for Geography done by Grade 12 learners were on the application and interpretation of topographical map and orthophoto map (DBE, 2011:64).

4.5 TEST OF SIGNIFICANCE OF STATISTICAL DATA

The researcher used Cronbach's Alpha test and Chi-Square test to check the reliability of learner's questionnaire.

4.5.1 The Cronbach's Alpha Test

The Cronbach's Alpha test was conducted to check the reliability of the learner's questionnaire. Takavol and Dennick (2011:53), report Cronbach's Alpha is expressed as a number between 0 and 1, where the internal consistency describes the extent to which all items in a test measure the same concept and thus connected to the interrelatedness of the items within the test. They further report that the acceptable values of Cronbach's Alpha range from 0.70 to 0.90, where a value under 0.70 could be attributed to a low number of questions pertaining to the specific subject or poor inter-relativity, though it will still be considered acceptable. The reliability tests performed yielded the results as follows:

Component	Reliability Statistics		
	Cronbach's Alpha	Chronbach's Alpha Based on Standardised Items	No. of Items
Learner's experience on learning Geography Mapwork	0.676	0.668	20

The Cronbach's Alpha test reflected high reliability value of 0.668 for the learner's experience on learning Geography Mapwork. These Cronbach's reliability value of 0.668 shows that questionnaires were reliable. It is important to note that the sample has been done on a very small scale, as the population sample was only a small representation of schools in Vhembe District, result cannot be generalised or be considered statistically significant within the general population. In order to improve the reliability of questionnaire, the researcher used Cronbach's Alpha values to test the reliability of items. It is commonly used to measure of internal consistency reliability is Cronbach's Alpha. "The Cronbach's Alpha provides a coefficient of inter-item correlations, that is the correlation of each item with the sum of all the other items" (Cohen, Manion & Morrison, 2007:506). Cronbach's Alpha quantified this reliability by proposing a coefficient which theoretically ranges from 0 to 1. If alpha (α) is near 0 then the quantified answers are not reliable, and if alpha (α) is close to 1 the answers are very reliable. The number of Cronbach's Alpha was 0.668 which is an acceptable level, therefore this questionnaire were reliable. This high value of

0.668 shows a high reliability between questions. The results below are the test of significance of learners' questionnaire :

ANOVA

		Sum of Squares	df	Mean Square	F	Significance Value
Between People		717.539	148	4.848		
8Within People	Between Items	294.849	19	15.518	9.865	0.668
	Residual	4423.401	2812	1.573		
	Total	4718.250	2831	1.667		
Total		5435.789	2979	1.825		

Grand Mean= 2.39

It is also important to note that when trying to comprehend statistics, it is essential to find the correlation between the variables. If there is a correlation between the variables, it can be said that there is a statistical significance. Researchers make use of p-values, and when these values are bigger than 0.05, they are seen as insignificant, thus only values smaller than and/or equal to 0.05, are considered to be statistically significant. The researcher used the crosstab and chi-square tests to examine and test significance of statistical data. When the p-value > 0.05 there is challenges of teaching Geography mapwork in Grade12, but when the p value < 0.05 there is no significant effect.

4.5.2 The Chi-Square Test

The researcher also used Chi-Square test to draw inferences to test the significance of learners' questionnaire. Contribution of class size to learner performance with gender had no significant effect on learner performance (Chi-Square =1.017, p-value = 0.797). But age in years had significant effect on learner performance (Chi-Square =17.727, p-value = 0.007). The following is a test summary of one sample of Chi-Square test :

4.4.1.1	Gender	Frequency	Percentage	P-Value
	Male	85	56.7	0.791
	Female	65	43.3	
	Total	150	100	
4.4.1.2	Age Group			
	17-19	70	46.7	0.007
	20-22	64	42.7	
	23 and above	16	10.7	
	Total	150	100	

When examining all 20 items, the results shows that the p-value is > 0.05 indicating that there is challenges of teaching Geography mapwork in Grade 12.

4.6 INTERGRATION OF THE QUALITATIVE AND QUANTITATIVE DATA

The main research question is: What are the challenges that teachers of Geography experience when they teach mapwork? In order to answer this question, both qualitative and quantitative data were collected and intergrated. Intergration refers to how the qualitative and quantitative data communicate to each other (Chen, 2012:140). This is due to the fact that, despite being mixed-method, the qualitative and quantitative data are treated as separate domains and do not mix with each other. Woolley (2009:7), suggests that “qualitative and quantitative data can be considered ‘integrated’ to the extent that those data are explicitly related to each other within a single study. The intergration of findings enables empirical results from one approach to comprehend the other.

The intergration of qualitative and quantitative data achieves evidence of triangulation in some important findings, thus enhancing the validity of the overall research study. Qualitative data was analysed thematically while quantitative data was analysed through SPSS version 25. Interview schedule was used to collect data from Heads of Departments and teachers while questionnaire was used to collect data from learners. Heads of Department understanding of challenges of

teaching Geography mapwork inventory was used as instrument to collect data from Heads of Department. Teachers challenges on teaching Geography mapwork inventory was used to collect data from Geography teachers. Quantitative data used learners experience on learning Geography mapwork inventory as an instrument to collect data. Qualitative and quantitative data were conducted almost at the same time, thus allowed the intergration to occur during the stage of data collection and data analysis, as well as in the discussion of the empirical findings.

The triangulation evidence mainly related to two aspects, firstly, empirical findings of the qualitative data showed that overcrowded classrooms impact negatively on both in the teaching of Geography mapwork. Likewise, the quantitative data revealed that class size contributes to the performance of learners in Geography mapwork. Additionally, qualitative data revealed that lack of learner-teacher support material was a challenge to both learners and teachers when Geography is taught. Similar findings were also observed from the quantitative data that there were shortage of Geography classrooms in schools. It can be seen that findings from both qualitative and quantitative data showed consistent evidence on the challenges of teaching Geography mapwork in Grade 12.

However, the differences between the two were that ,qualitative and quantitative data have two different sample size. The qualitative data were collected from a smaller sample than quantitative data, for example, qualitative data were collected from 5 HOD's and 5 teachers while quantitative data were collected from 150 Geography learners.

4.7 CONCLUSION

In this chapter, data from interviews and questionnaires were presented. The interview data were based on the experiences, knowledge and views of heads of department, teachers and learners of Geography mapwork in Nzhelele West Circuit, Vhembe District in the Limpopo Province. All the participants strongly agreed that there are challenges experienced when teaching Geography mapwork in Nzhelele West Circuit, Vhembe District in Limpopo Province. The challenges that arise when teaching Geography mapwork from the data include the following: learners' using of

English language, learners' absenteeism in classrooms, learners' lack of prior knowledge and foundation, learners' attitudes towards Geography mapwork, constant changes of Geography mapwork curriculum, challenges of assessing Geography mapwork, learner-teacher support materials, overcrowding of classrooms, traditional approaches used by teachers to teach the subject, teachers' attitude towards Geography mapwork and shortage of Geography mapwork teachers. The next chapter presents a summary, limitations, conclusion, recommendations and suggestions for further study.

CHAPTER 5

SUMMARY, LIMITATIONS, CONCLUSION, RECOMMENDATIONS AND SUGGESTIONS FOR FURTHER STUDY

5.1 INTRODUCTION

This chapter presents the summary, limitations of the study, conclusion and recommendations to the study. It further gives the suggestions for further study and conclusion remarks.

5.2 SUMMARY OF THE STUDY

The summary of the study outlines the findings of the research questions, summary of literature review findings and the empirical findings.

5.2.1 How the Study Responded to the Research Questions

Research Questions 1: What are the Challenges Learners Experience when they Study Mapwork in Geography?

Departmental heads revealed that learners experience many challenges when they study mapwork in Geography such as lack of interpretations of both topographical map and orthophoto maps, lack of basic foundation from senior phase and learners' attitude towards mapwork (See Paragraph 1.p.85). Teachers' responses also revealed that lack of prior knowledge, negative attitudes towards Geography mapwork and lack of mathematical skills to calculate gradient and vertical exaggeration and learners don't understand the language of Geography mapwork used by teachers which is always in English are the most challenges faced by learners (See Paragraph 2.p.90). One can, therefore determine that the research replied to the question.

Research Question 2: What are the Challenges Experienced by Teachers of Geography in the Teaching of Mapwork

Departmental heads revealed that overcrowded classroom is one of the major challenge that experienced by Geography teachers when they teach mapwork. The class sizes have been seen as having an impact in teaching and learning and have a negative influence on learners' performance by departmental heads (See Paragraph 1. p.85). Teachers' response's revealed that classes are overcrowded and congested such that it is a major prohibiting factor. All the participants also concurred with the fact that teaching and learning resources are inadequate to teach geography mapwork. This concurs with literature findings which indicates that lack of learner-teacher support material is a challenge that confront teachers when they teach mapwork (See Paragraph 3 p.55). Looking at participants' responses and the literature reviewed, one can conclude that teachers experience challenges when they teach Geography mapwork.

Research Question 3: What are the Teaching Strategies that can be Adapted to Teach Mapwork in Geography

Departmental heads revealed that co-operative learning strategy, project-based teaching strategy and inclusive teaching are the teaching strategies that can be adopted to suit the teaching of Geography (See Paragraph 1.p.87). In co-operative learning, learners are assessed as a group and learners contest to see who the "best" is. In terms of inclusive teaching, the teacher should try to address barriers arising from the classroom in order to accommodate different learning needs. Teachers concurred with departmental heads by revealing that co-operative learning is the best way to teach learners as they share ideas and best practises (See Paragraph 1. p.92).

5.2.2 Summary of the Literature Review

Summary of the literature review is discussed in this section:

Literature review shows that teachers experience challenges when they teach Geography mapwork to learners (See Paragraph 1 p.48). The constant changes of Geography Curriculum affect the teaching of Geography mapwork. The way assessment of Geography is administered also affect learners' performance. The fact that Geography final examination papers are written in one day also affect teachings of Geography mapwork. The literature review also revealed the experiences of teaching Geography mapwork in other countries like Turkey and Nigeria.

It was also necessary to come up with acceptable standards of quality Geography teaching (See Paragraph 1 p.21). One of the acceptable standard is that the teacher should simplify the mapwork language when teaching the learners. The study also examined Geography mapwork-specific curriculum knowledge challenges with special emphasis on Geographic Information Systems (GIS). Literature review also revealed that teachers who are supposed to assist the learners in Geography mapwork also need help themselves (See Paragraph 2 p.26).

Literature indicates that there are teaching strategies that can be adapted to teach mapwork in Geography such as cooperative and collaborative teaching strategies (See Paragraph 2 p.64). This are the methodologies that could be used to teach the training of teachers to assist learners is necessary in Geography mapwork to teach Geography mapwork.

5.2.3 Summary of Empirical Findings

Qualitative results revealed that departmental heads and teachers encounter some challenges when teaching Geography mapwork. Quantitative data also revealed that learners encounter some challenges when they are taught Geography mapwork. The following findings were found:

5.2.3.1 Challenges learners experience when they study mapwork in Geography

Collected data showed that learners experience some challenges when they study mapwork in Geography. Hence, learners experience some difficulties when they study Geography mapwork. Departmental heads indicated that learners experience some challenges when they study mapwork in Geography such as lack of interpretations of both topographical map and orthophoto maps, lack of basic foundation from Senior Phase and learners' attitude towards mapwork. It also transpired that learners even struggle to answer mapwork calculations due to lack of mathematical background.

Teachers' responses also claimed that lack of prior knowledge, negative attitudes towards Geography mapwork and lack of mathematical skills to calculate gradient and vertical exaggeration and learners don't understand the language of Geography mapwork used by teachers which is always in English are the most challenges faced by learners. Learners' responses also revealed that there are challenges they encounter when they learn Geography mapwork.

5.2.3.2 Elements experienced by teachers of Geography in the teaching of mapwork

The findings of the research also pointed out that teachers experience challenges when they teach Geography mapwork generally. Teachers revealed that overcrowded classroom is one of the challenge experienced by Geography teachers when they teach mapwork. The class sizes have been seen as having an impact in teaching and learning and have a negative influence on learners performance by teachers.

Teachers' response's revealed that classes are overcrowded and congested such that it is a major prohibiting factor. All the teachers also concurred with the fact that teaching and learning resources are inadequate to teach Geography mapwork. This concurs with literature findings which indicates that lack of learner-teacher support material is a challenge that confront teachers when they teach mapwork (See Paragraph 2.54). Looking at participants' responses and the literature reviewed, one

can conclude that teachers have challenges that they experience when they teach Geography mapwork.

5.2.3.3 Teaching strategies that can be adapted to teach Geography mapwork

Qualitative findings revealed that some teachers are using teacher-centred teaching strategies to teach learners. Heads of department revealed that co-operative learning strategy, project-based teaching strategy and inclusive teaching strategy are the learner-centred teaching strategies that can be adapted to teach Geography mapwork (See Paragraph 1. p.87).

In co-operative learning, learners are assessed as a group and learners contest to see who the “best” is. In terms of inclusive teaching, the teacher should try to address barriers arising from the classroom in order to accommodate different learning needs. Teachers concurred with departmental heads by revealing that co-operative learning is the best way to teach learners as they share ideas and best practises.

From the qualitative and quantitative findings, it is clear that all the participants believe that learner-centred teaching strategy like co-operative learning is suitable to teach Geography mapwork. Since departmental heads, teachers and learners are in agreement that co-operative learning is the best teaching strategy, it is conclusive that Geography mapwork teachers should adopt it and use it to improve teaching and learning.

5.3 LIMITATIONS OF THE STUDY

This study has the following limitations:

- The study was only conducted at Nzhelele West Circuit in the Vhembe District of Limpopo Province. Possibly different findings would have been made at the district and provincial level if the study was extended to other circuits and other districts of the province. Therefore, the findings of the study cannot be generalised to a larger sphere of influence, provincially-based population.

- Due to time and financial constraints, the research was restricted to five secondary schools in the Nzhelele West Circuit, hence, a small sample of population was used in the study. Therefore, the generalization of the outcome to a large population is not possible. One can therefore, speculate that if more schools had been used in the research, different findings might have emerged.
- Nzhelele West Circuit is located at Makhado municipality which is a rural area. The research findings are therefore limited to rural area perceptions only. Therefore, the results could have been different if schools in the urban areas are included in the study.

5.4 CONCLUSION

The study investigated the challenges teacher experience in teaching mapwork in Geography at Grade 12 within the District of Vhembe in the Limpopo Province. The review of literature and the empirical findings suggest that teachers should receive special training on learner-centred teaching strategies to teach Geography mapwork effectively. Geography teachers should adopt the best learner-centred teaching strategies recommended in this study in order to improve learners' understanding of Geography mapwork curriculum. There should also be a close cooperation between Circuit managers, Curriculum advisors, Heads of department and teachers for effective teaching and learning of Geography mapwork.

5.5 RECOMMENDATIONS

The study recommends that:

- Teachers should assist learners to master the interpretation of both topographical map and orthophoto maps.

- The Department of Basic Education should provide necessary infrastructure in the form of classrooms in schools to motivate teaching of Geography mapwork.
- It is recommended that learners should be taught basic mapwork skills from lower Grades to prepare them for Grade 12 classes.
- All relevant stakeholders like teachers, HODs', principals, parents and Circuit managers should come up with intrinsic and extrinsic motivation to motivate learners so that they should have positive attitude towards Geography mapwork.
- Curriculum advisors should come up with special programmes that can be used to motivate Geography teachers positively.
- The Department of Education should have more in service training and workshops to train teachers to use learner-centred teaching strategies when teaching Geography mapwork.

5.6 SUGGESTIONS FOR FURTHER STUDY

The study achieved its purpose, hence, **to investigate the challenges teacher experience in teaching mapwork in Geography at Grade 12**. However, it has therefore opened up the following avenues for further research by scholars:

- The study was confined to secondary schools in the Nzhelele West Circuit in Vhembe District. However, not all secondary schools and circuits were covered in the Vhembe District. Therefore, a further suggestion would be that a similar study be conducted in the other schools and circuits in order to assess whether the study would yield similar findings regarding the challenges teacher experience in teaching mapwork in Geography at Grade 12.

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APPENDICES

APPENDIX A

HEADS OF DEPARTMENTS UNDERSTANDING OF TEACHING OF GEOGRPHY MAPWORK INVENTORY

1. BIOGRAPHICAL INFORMATION

1.1 Gender: _____

1.2 Age in years: _____

1.3 Designation: _____

1.4 Highest Educational Qualification: _____

1.5 Professional Qualification: _____

1.6 Teaching Experience in years: _____

1.7 Experience as a head of department in years: _____

2. CONTEXTUAL RESEARCH QUESTIONS

2.1 What are the challenges learners experience when they learn Geography mapwork?

2.2 How do you encourage and motivate teachers to perform better in Geography mapwork?

2.3 What support mechanisms do you use to provide quality teaching of Geography mapwork?

- 2.4 What are the challenges you experience in managing teaching and learning and does this apply to teaching of Geography?
- 2.5 What are the teaching strategies that can be adopted to enhance the teaching of Geography?
- 2.6 What kinds of learner- teacher support materials are made available to teachers of Geography mapwork?

THE END

THANK YOU FOR YOUR TIME AND CO-OPERATION

APPENDIX B

TEACHERS' CHALLENGES ON TEACHING GEOGRAPHY MAPWORK INVENTORY.

1. BIOGRAPHICAL INFORMATION

1.1 Gender: _____

1.2 Age in years: _____

1.3 Designation: _____

1.4 Highest Educational Qualification: _____

1.5 Professional Qualification: _____

1.6 Teaching Experience in years: _____

2. CONTEXTUAL RESEARCH QUESTIONS

2.1 What do you think are the challenges experienced by learners when they learn mapwork in Geography?

2.2 What are the challenges that confront you when you teach mapwork?

2.3 What would you regard as appropriate learning support material of Geography mapwork?

2.4 In what ways would Geography mapwork be taught with understanding to learners

2.5 How do you apply learner assessment as learning tool?

2.6 How would in-service training workshops develop your teaching skills and subject Knowledge?

THE END

THANK YOU FOR YOUR TIME AND CO-OPERATION



APPENDIX C

CONSENT FORM FOR PARENTS / GUARDIAN OF LEARNERS

Dear Parent/ Guardian

I am studying for M.Ed. Degree at the University of Venda. I am currently conducting research on the Teaching of Geography Mapwork. Your child is a student of Geography who I identified as one of those who would provide some information on how they are taught Mapwork.

May I humbly request that you give permission to administer a research data collection instrument on your child?

Yours sincerely

A Mukondeleli

Name of parent/Guardian:.....

Signature:.....

Date:.....

APPENDIX D

LEARNERS EXPERIENCE ON LEARNING GEOGRAPHY MAPWORK INVENTORY

1. BIOGRAPHICAL INFORMATION

Kindly complete this section by providing the required information.

1.1 Gender: _____

1.2 Age in years: _____

1.3 Grade: _____

1.4 Stream (Classification of area of study): _____

2. GEOGRAPHY MAPWORK: CONTEXTUAL INFORMATION

In this section, statements regarding how Geography Mapwork is taught are provided. Read each statement carefully and decide whether you **strongly agree**, **Agree**, **Neutral**, **Disagree** or **Strongly Disagree**. Indicate your decision by marking the appropriate space with a X.

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
2.1	The class size contributes to the performance of learners in Geography mapwork.					
2.2	I do have a Geography mapwork textbook					
2.3	Learners' attitudes contributes					

	to learner performance in Geography mapwork.					
2.4	I enjoy calculations in Geography mapwork.					
2.5	I enjoy teaching and learning of Geography mapwork.					
2.6	I enjoy lessons on Geography mapwork.					
2.7	My teacher is competent to teach Geography mapwork					
2.8	I am more involved in practical aspects of Geography mapwork than theoretical part of it.					
2.9	Working in groups improves learners' performance in Geography mapwork.					
2.10	I have more background of Geography mapwork when I came to grade 12.					
2.11	The foundation of learners in Geography mapwork affects learners' performance.					
2.12	The use of English as a language of learning and teaching impact positively in learners' performance in					

	Geography mapwork.					
2.13	Learners' class attendance in Geography classroom affects learners' performance.					
2.13	Learners are motivated to attend Geography mapwork lessons at school.					
2.15	There is a good relationship between the teacher and learners of Geography mapwork.					
2.16	There is a classroom for teaching Geography mapwork at school.					
2.17	The teacher gives us activities on Geography mapwork.					
2.18	There is a Geography mapwork teacher at our school					
2.19	Geography mapwork calculations are difficult due to mathematical background					
2.20	Learners are able to interpret both topographical map and orthophoto map					

THE END



APPENDIX E

LETTER OF REQUEST TO CONDUCT RESEARCH IN VHEMBE DISTRICT

Enq: A. MUKONDELELI
TEL: 076 036 9575

P.O BOX 2286
DZANANI
0955

THE DISTRICT DIRECTOR
ATTENTION: Dr. Rambiyana
P/BAG X2250

24 October 2017

SIBASA
0970

Dear Sir

REQUEST FOR PERMISSION TO CONDUCT RESEARCH IN VHEMBE DISTRICT:

I hereby request permission to conduct a research in Nzhelele West Circuit in the Vhembe District. I am currently studying for a master's Degree in Curriculum Studies at the University of Venda for Science and Technology. The topic of my study is: **Teaching of Geography mapwork in Grade 12: A case of Nzhelele West Circuit in Vhembe District.**

I also would like to inform you that all the information gathered from teachers and learners will be used solely for research purposes and that the anonymity of all participants is guaranteed.

I trust that you will grant me the consent in conducting my research.

Hoping that my request will receive your favourable consideration.

Yours Faithfully

A. Mukondeleli

APPENDIX F

PERMISSION TO CONDUCT RESEARCH FROM VHEMBE DISTRICT



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION
VHEMBE DISTRICT

CONFIDENTIAL

REF: 14/7/R
ENQ: MATIBE M.S
TEL: 015 962 1029

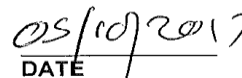
MUKONDELELI A
P.O. BOX 2286
DZANANI
0955

DEPARTMENT OF EDUCATION
VHEMBE DISTRICT
2017 -10- 05
PRIVATE BAG X 2250 SIBASA 0970 TEL: 015 962 1313/4 FAX: 015 962 6039
LIMPOPO PROVINCE

REQUEST FOR PERMISSION TO CONDUCT RESEARCH.

1. The above matter bears reference.
2. Your request for permission to conduct research in Nzhelele West Circuit on the topic: "Challenges experience when teaching Geography mapwork in Grade 12" has been granted.
3. Kindly inform the circuit manager and the principals of selected schools prior to your visits.
4. It is expected of you to ensure that your interaction with educators will not disrupt the normal teaching and learning activities.
5. Wishing you the best in your studies.


DISTRICT DIRECTOR


DATE

APPENDIX G:

PERMISSION TO CONDUCT RESEARCH FROM NZHELELE WEST CIRCUIT



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

**DEPARTMENT OF EDUCATION
VHEMBE DISTRICT**

West Circuit
Private Bag X1001
Dzanani
0955
Telefax: 015 970 4537

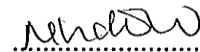
NZHELELE WEST CIRCUIT

Enq: Ravele NS
Tel: 015 970 4537
Cell: 0721427704

TO: MUKONDELELI A
P.O. BOX 2286
DZANANI
0955

REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT NZHELELE WEST CIRCUIT.

1. The above matter refers.
2. This letter serves to confirm that the District Office has granted you permission to conduct research on the topic provided.
3. Kindly stick to the requirements listed on paragraphs three and four of your District approval.
4. Hoping for your cooperation in this regard.


.....
Nzhelele West Circuit Manager

01.11.2017.....
Date



NZHELELE WEST CIRCUIT MAKHADO EMPC ADMINISTRATION BUILDINGS
Private Bag X1001, Dzanani, 0955, Telefax: 015 970 4537
The Heart Land of South Africa – Development is about people! Batho Pele, People First, VAatAn PAanda!

1



APPENDIX H

EDITOR'S LETTER

SCHOOL OF HUMAN AND SOCIAL SCIENCES

5 May 2018

School of Education
University of Venda
Thohoyandou
0950

Sir/madam


This serves to certify that I have proof-read A. Mukondeleli's dissertation titled, "Challenges Experienced in Teaching Geography Mapwork in Grade 12: A Case of Nzhelele West Circuit in Vhembe District"

The proof-reading entailed editing some parts from it, where I felt it would make the document more understandable; for example, to avoid wordiness, redundancy; sub-dividing sentences, and so on. However, I have not tampered with the content of the document, except where I found that this constituted repetition or made the document confusing.

The dissertation is presently ready for submission.

Thank you for your time.

Sincerely


.....
V.T. Bvuma
083 423 9227



University of Venda

UNIVERSITY OF VENDA

PRIVATE BAG X5050, THOHOYANDOU, 0950, LIMPOPO PROVINCE, SOUTH AFRICA
TELEPHONE (015) 962 8172 FAX (015) 962 8416
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"A quality driven, financial sustainable, rural-based comprehensive University"