GEOGRAPHY TEACHERS' REFLECTIONS ON TEACHING TOPOGRAPHY

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Declaration

I, Lucky Nhlanhla Khumalo, declare that:

i. The research in this dissertation, except where otherwise indicated, is my original work.

ii. This dissertation has not been submitted for any qualification or examination at any other University.

iii. This dissertation does not contain other persons' data, pictures, graphs, or other information, unless specifically acknowledged as being sourced from other persons.

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Supervisor's statement

As the candidate's supervisor, I, Dr Makhosazana Shoba, agree/do not agree to the submission of this Dissertation.

Signature: Date:

Acknowledgements

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Dedication

This dissertation is dedicated to my late mother, *Nomusa "No" Khumalo*, and my late grandmother, *Agnes MaZulu Khumalo*, whose unwavering trust and belief in me inspired me to aim higher and push boundaries. Without them, I would not be where I am or who I am today.

Abstract

In view of the scant existing research on topography teaching, this study focused on how topography is taught in South African schools and aimed to fill this gap by exploring geography teachers' reflections on teaching topography in four schools in Chatsworth. This dissertation adopted an exploratory case study rooted within the interpretive paradigm. It explored geography teachers' reflections on teaching topography to understand their reflections, what informs them, and what we can learn from them. This exploration therefore necessitated the use of the interpretive paradigm. The study used reflective activity and semi structured interviews to draw out teachers' reflections on teaching topography. The convenience and purposive sampling techniques were used to select the geography teachers from whom the data to fulfil the aims of this study was generated. The study employed the guided data analysis approach to analyse the elicited data. The reflective activity and interview questions used to obtain teachers' reflections on teaching topography were underpinned by the guiding questions of the curricular spider web concepts. The findings of this study indicate that geography teachers mainly engage in practical reflection when evaluating their teaching of topography. It appears that teachers are largely impelled by their professional rationale in their reflections. Thus, their teaching of topography is mainly guided by the prescriptions of the curriculum policy rather than their personal perspectives or societal needs. As such, teachers adhered to the guidelines of the Curriculum Assessment Policy Statements (CAPS) curriculum when deciding what to teach (content), when to teach (time) and how to teach it (teaching goals). However, the findings of this study further indicate that teachers' compliance to the predetermined standards of the intended curriculum (professional rationale) made teachers unable to transform topography curriculum to suit learners' needs. Therefore, it is suggested in this study that teachers draw from all three teaching rationales (personal, professional, and societal) for a balanced implementation of topography where teachers' personal perspectives, professional knowledge, and societal needs are considered in topography teaching.

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CHAPTER ONE

Background and Orientation to the study

1.1 Introduction

This chapter aims to provide the scope of this study by outlining the purpose and focus for which this research study is undertaken, the background of the study, the rationale as well as the problem statement. Thereafter, it gives insights into the significance of the study, the location, the key research questions, and the research objectives. This chapter further provides a summary of the research design and methodology used in guiding this research study. The chapter concludes by providing the overview of the subsequent chapters.

1.2 Purpose and focus of the study.

This study is intended to explore geography teachers' reflections on teaching topography. Topography is a scientific discipline concerned with studying surface relief landforms such as land, mountains, basins, valleys, rivers and more (Markoski & Markoski, 2018). Further, it looks at how these relief landforms came to be and how they influence people's lives (Mark & Smith, 2004). In the Geography subject, topography is mainly taught in the FET phase using topographical maps and orthophoto maps (Department of Basic Education, 2014). In the geography subject, topography is referred to as mapwork. Thus, this study uses mapwork and topography interchangeably.

1.3 Background to the study

Topography plays an essential role in the geography subject. It provides a foundation for analysing, interpreting, and understanding the earth's surface and its natural and physical features and their interaction with people (Mark & Smith, 2004; Markoski & Markoski, 2018). The topography of an area is represented using maps, which depict the climate conditions, geomorphology, settlement, and economic conditions of an area (Markoski & Markoski, 2018). As a result, topography is generally viewed as the heart of geography. This has been argued by many different scholars, including Hartshorne (1939, p. 2), who argued that "so important is the use of maps in geographic work that…it seems fair to suggest to the

geographer that if the problem cannot be studied fundamentally by maps…then it is questionable whether or not it is within the field of geography". This suggests that if a problem that cannot be understood, visualised or analysed in a spatial context, it raises doubts about its relevance to the geography subject, which primarily deals with the study of spatial patterns, relationships, and processes on the earth surface (Markoski & Markoski, 2018). Bednarz et al. (2006, p. 3) concur that "maps are not the whole of geography, but there can be no geography without them". Thus, topography or mapwork has long been recognised as an indispensable part of geography.

Innes (1998) encapsulates the importance of topography in geography by identifying professions and professionals who rely on maps in their practice. These include engineers who utilise maps to plan and design roads; soldiers require maps to plan battles; geologists and surveyors use maps for their fieldwork; and spatial planners depend on maps to design and plan cities. These professionals need to understand the topography of an area to be able to fight wars, design roads and bridges, extract minerals from the earth, and design cities. Thus, map skills are a prerequisite in these important fields. However, topography teaching is underplayed in many schools as local and international literature shows that teachers seem to be unable to handle some mapwork topics (Ahiaku et al., 2019; Bednarz et al., 2006; Mukondeleli, 2018; Mwenesongole, 2009). Thus, learners who may want to pursue the career fields examined by Innes (1998) are most likely to lack the foundational basics of reading and understanding maps.

Teachers have the responsibility to ensure that all the goals and objectives of the subjects they teach are met. Surprisingly, many studies have noted that many geography teachers possess insufficient pedagogical content knowledge (PCK) to effectively implement the topography curriculum (Ahiaku & Mncube, 2018; Ezeudu & Ojih, 2014a, 2014b; Mukondeleli, 2018). PCK is defined by Shulman (1987) as teacher's competence in delivering the content of a subject through employing appropriate and effective teaching strategies. Thus, there is no guarantee that topography is enacted accordingly, and its goals are met as geography teachers are said to lack PCK. Scholars such as Bednarz and Schee (2006), Gökçe (2015), and West (2006) argue that teachers' inability to teach topography effectively is partially due to the lack of appropriate instructional resources to present

mapwork content to learners. Thus, the government has not fully played their part in ensuring effective topography teaching in schools. Similarly, a study by Wilmot and Irwin (2015) concluded the South African geography curriculum lacks continuity, affecting how teachers present mapwork lessons to learners.

Seemingly, the South African government is aware of its shortcomings in the geography subject as there have been multiple curriculum changes implemented at the micro-level (policy level) to strengthen social sciences education in general, under which geography education is provided. The changes occurred in four phases. Firstly, the Department of Basic Education (DBE) introduced an interim curriculum in 1996, followed by the introduction of Curriculum 2005, the introduction of the Revised National Curriculum (RNC), and most recently, the introduction of the Curriculum Assessment and Policy Statement (CAPS) (Beets & Le Grange, 2008). The strength of geography, however, particularly the topography component, continues to decline nonetheless as it is still underplayed in the CAPS curriculum (Ahiaku et al., 2019). This suggests that these changes had little to no effect on improving education standards.

This study explored mapwork teachers' reflections on teaching topography to understand how they interact with the intended (curriculum expectations), implemented (what is taught in the classroom), and attained curriculum (knowledge and skills retained by learners). Their reflections were explored to ascertain what they are, what informs them, and what we can learn from them to improve the topography teaching in South African schools. This study paid attention to topographical map teaching as it has been identified as the most challenging aspect for many teachers, especially those who lack mathematical proficiency in teaching mapwork calculations (Ahiaku & Mncube, 2018; Department of Basic Education, 2014).

1.4 Rationale of the study

The current study explored geography teachers' reflections on teaching topography. The impetus for this study came from my experiences as a geography student-teacher and the existing literature I have engaged with on mapwork teaching. During my teaching practice, I observed that geography teachers seem to experience difficulties with teaching topography.

This became apparent to me when, in one school, a teacher asked me to teach mapwork to grade 12 geography learners in the third term of the school calendar. The teacher confided that her grade 12 learners seemed to struggle with topographic map skills and felt that it would make a difference if they were taught topography by someone who spoke their language, as there seemed to be a language barrier between her and the learners.

Although the problem may have been the language barrier in the first school, in another school located in a township, I had a slightly similar experience. In this particular school, I was asked to teach topography to grade 10 learners even though the teacher had already covered it in the first term. Surprisingly, this teacher also believed it might help learners if a different person taught them as they seemed to have not adequately grasped topographic map skills. These two separate yet similar incidents brought to realisation that some geography teachers are unable to meet the teaching outcomes of topography. Consequently, I took the responsibility to engage with pertinent scholarly literature on topography teaching to understand why some teachers may be unable to teach mapwork. I explored both local and international literature to find out what academics are saying about the teaching of topography or mapwork in secondary schools.

In the literature, it appears that topography teaching is an extensively explored phenomenon in South Africa and has recently resurfaced due to its perceived poor performance (Ahiaku & Mncube, 2018; Ahiaku et al., 2019; Manik, 2022). However, a considerable number of studies relating to topography teaching focus on geographic information systems (GIS), with only a few studies paying attention to mapwork from a general standpoint. Therefore, this study contributes to the literature on topography, particularly topographical map teaching. In addition, as a geography teacher with limited experience in teaching topography and who has only taught topography during practicum, this study afforded me multiple internal and external viewpoints regarding topography teaching in South African schools (Santoro et al., 2011). Thus, despite my restricted exposure to teaching topography, this study allowed me to gain insights from experienced geography teachers to understand the situational context of topography teaching in schools.

1.5 Problem statement

Topography education in South African schools has been falling short of the expectations in matric examinations (Ahiaku & Mncube, 2018; Ahiaku et al., 2019). The diagnostic report conducted by Department of Basic Education (2020) to gauge an average performance per sub-question in Paper 2 (mapwork examination) shows an average of below 50% in majority of the exam questions. This report indicates that learners performed poorly in questions that relate to mapwork calculations and map interpretation and analysis. Similar findings have been reported in the study conducted by Ahiaku and Mncube (2018) and Ahiaku et al. (2019) who argue that geography teachers grapple with teaching topographic skills leading to poor performance in the mapwork aspect. This suggests that topography teaching is an issue in South African schools as it was reported in the diagnostic report of 2014 that learners performed poorly in mapwork section (Department of Basic Education, 2014). However, there is limited literature relating to the teaching of topographical maps in South African schools. It is for this reason that the current study aims to explore geography teachers' reflections of teaching topography in four schools in Chatsworth.

1.6 The significance of the study

Bradbury-Jones et al. (2017) state that research studies are conducted to either understand a certain problem or issue, advance existing knowledge by filling up the gaps, or respond to societal challenges. Existing research by Ahiaku et al. (2019) examining teachers' experiences of teaching topography found that geography teachers are confronted with a lack of appropriate instructional resources in schools and insufficient pedagogical content knowledge to teach mapwork. Similarly, studies such as (Ahiaku & Mncube, 2018; Bednarz & Schee, 2006; Ezeudu & Ojih, 2014a; Mukondeleli, 2018; Naxweka & Wilmot, 2019; Shin, 2006) view the lack of instructional resources and teachers' incompetence as the major contributing factors to the issue of poor academic achievement in topography and in the geography subject overall.

Some scholars have examined factors that are likely responsible for geography teachers' inability to handle topography content effectively. These include scholars like Ezeudu and Ojih (2014a), who found teacher experience to positively influence how geography teachers

teach topographic map skills in the classroom. Ahiaku and Mncube (2018) concur that teacher experience seems to be at play in the way teachers present mapwork content, especially if they have been teaching in the same school and participated in marking national examinations. However, Ahiaku et al. (2019) and Naxweka and Wilmot (2019) disconfirmed the correlation between teachers' array of experience and effective topography teaching.

Furthermore, the area of specialisation and teacher qualifications are other factors that have been scrutinised to determine whether they have an influence on the pedagogical knowledge of geography teachers to teach topographic map skills. Ezeudu and Ojih (2014b) found these factors to have a positive relationship with teachers' ability to teach topography. They found that teachers with higher levels of education are seemingly better at teaching topography than those with lower levels of education. They also reported that teachers who specialised in geography in their teacher preparation program were better than those who did not. However, Ahiaku and Mncube (2018) found the correlation between academic achievement and effective topography teaching to be non-existent, as even the highly educated teachers (with master's degrees) sampled in their study struggle to teach GIS, which falls under the mapwork component.

Exclusively, topography teaching is a scantly explored phenomenon. A remarkable amount of the existing literature focuses on mapwork teaching from a general standpoint. Thus, it is inclusive of the GIS and Aerial photograph aspects, which are also constituents of the mapwork component. The limited literature on topography teaching laid an impetus for this study. Especially since most of the mapwork topics that are deemed challenging for teachers have been identified to fall under topographical maps (Ahiaku & Mncube, 2018). This, therefore, renders the study of this nature significant as it may advance exiting knowledge on topography teaching (topographic maps) in South African schools. Bryman (2016) posits some of the many reasons for which people conduct social research may include a literature gap, or an inconsistency between the number of studies (which laid an impetus for the current study), or an unresolved problem in the society or literature.

Furthermore, the findings of this study may help outline the areas of concern regarding topography teaching in South African schools. Consequently, this might help advance emerging research on topography teaching. The findings of this study may also be useful to geography teachers who may resort to scholarly literature to handle challenges related to topography teaching and improve their practice. Further, this study may also highlight for teachers the importance of understanding and reflecting upon the curricular spider web (framework suggested by Van den Akker et al. (2003) for curriculum development and used in this study as the conceptual framework) that inform the geography curriculum under which topography is offered.

1.7 Location of the study

The study was conducted in four schools located in Chatsworth township in Units 1, 2, and 3. The schools fall under the uMlazi circuit in the Durban District (KwaZulu-Natal). The sampled schools all offer grades 8-12 but offer different streams or subjects in grades 10-12. In all four schools, geography education is offered from grades 10-12 within the science stream. Thus, all the schools have at least one geography teacher. Though these schools are multi-racial, they have predominantly Indian learners. One thing common in all four schools is that learners come from varying socio-economic classes. A high population of learners in each school come from middle-classes households, but each school has its fair share of black learners coming from informal settlements.

1.8 Research objectives

The study will be underpinned by the following three objectives.

1. To explore what Geography teachers' reflections on teaching topography are.
2. To understand what informs Geography teachers' reflections on teaching topography.
3. To explain the lessons that can be learned from Geography teachers' reflections on the teaching of topography.

1.9 Research questions

The three questions below guided the direction of this study.

1. What are Geography teachers' reflections on teaching topography?
2. What informs Geography teachers' reflections on the teaching of topography?
3. What lessons can be learned from Geography teachers' reflections on the teaching of topography?

1.10 Literature review

Dewey (1933, p. 9) defines reflection as "an active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and further conclusion to which it tends". This suggests that reflection is an active and continuous process whereby teachers assess and re-assess the effectiveness of their practices and the reasons that underpin them. Reflective practice can be applied in multiple professions, including education, medicine, social sciences, and nursing (Ashby, 2006; Chretien et al., 2012; Cunningham & Moore, 2014). In education, reflection (or reflective practice) is viewed as an essential part of teaching (Freese, 2006; Muchnik-Rozanov & Tsybulsky, 2019; Sutherland et al., 2010; Zahid & Khanam, 2019). These scholars reveal that reflection helps teachers improve their practice, which enhances learner performance, as suggested by (Kheirzadeh & Sistani, 2018). Thus, reflection enables teachers to identify and work on their areas of weaknesses. This suggests that reflection may lead to quality education.

Furthermore, Khoza (2018) argues that reflections constitute the implemented curriculum in education. He goes further to describe the implemented curriculum as teachers' interpretations of the intended curriculum. Thus, what gets taught (implemented) in class is teachers' understanding of what the intended curriculum requires them to teach, which they develop by reflecting on the teaching content and theories (Van den Akker et al., 2009). However, Khoza (2015b) found teachers to possess insufficient knowledge of the official school curriculum. This discrepancy was highlighted by teachers' inability to reflect on all the issues of the curricular spider web, suggesting that they were not adequately implementing the school curriculum. Mpungose (2015) reveals that teachers seem to reflect on the curriculum from a personal level, leaving out the professional and societal levels, leading to distortion between the official school curriculum and implemented curriculum. Thus, there is a misalignment between the intended and achieved curriculum.

1.11 Research design

This section summarises the research design and methodology that guided this inquiry. A comprehensive description of the research design and methodology employed in this study is presented in chapter four.

The research study used a qualitative research approach to explore geography teachers' reflections on teaching topography. Smith (1996) defines the qualitative approach as a research methodology that captures the meaning of a phenomenon through exploring, understanding, and describing the accounts of people who are experiencing or have experienced the phenomenon under scrutiny. This positioned the qualitative approach most appropriate for this study as it allowed me to explore, understand, and interpret the reflections of geography teachers on teaching topography. It afforded me the opportunity to gain insights into their lived experiences and answer the research questions.

This study was located within the interpretive paradigm. Ontologically, the interpretive paradigm assumes that there are different social realities influenced by individuals' different cultures, circumstances, and times that shape their understanding of phenomena they go through (Alharahsheh & Pius, 2020). Hence, epistemologically, within this paradigm, knowledge is believed to be socially constructed by individuals. As a result, their understanding of the same phenomenon may differ from person to person, depending on the beliefs, values, and culture that underpin their reasoning (Thanh & Thanh, 2015). This rendered the interpretive paradigm as the most appropriate lenses through which I explored how different geography teachers reflected on their teaching of topography.

Furthermore, this study employed the case study design. Baxter and Jack (2008) and Heale and Twycross (2018) define the case study as a research design that allows researchers to closely explore a phenomenon within its natural setting. The phenomenon explored in this study is geography teachers' reflections on teaching topography. Thus, the case study was appropriate for this study to allow geography teachers to be interviewed at school. Baxter and Jack (2008) further posit that there are different types of case study method. This study used exploratory case study design because it sought to develop insights into a problem that is inaccessible in the existing literature (Yin, 2014).

1.12 Research participants selection

The selection of research participants or sampling strategy is defined by Sharma (2017, p. 749) as "a technique (procedure or device) employed by a researcher to systematically select a relatively smaller number of representative items or individuals (a subset) from a pre-defined population to serve as subjects (data sources) for observation or experimentation as per objectives of his or her study". However, referring to research participants or treating them as "subjects" is contested in qualitative research as they are autonomous beings. Bhardwaj (2019) concurs that sampling is a procedure adopted to select a group of people from a larger population from which to generate data, depending on where they meet the inclusion criteria of the study. This study employed convenience sampling to select available geography teachers in schools around Chatsworth and who were willing to participate in the study.

1.13 Data generation methods

This study utilised two data generation methods. It used the reflective activity and semi-structured one-on-one interviews. Jackson et al. (2007) define data generation methods as the tools, procedures, or techniques used by researchers to generate research data. Each of the methods used in this study was utilised for a specific purpose.

1.13.1 The reflective activity

The reflective activity, designed as an open-ended questionnaire, was used to prompt participants to reflect on their teaching of topographical maps without being in my presence as the researcher. This was done in an attempt to ensure that participants provided honest answers in the reflective activity (open-ended questionnaire). Cohen-Sayag and Fischl (2012) describe the reflective activity as any activity designed to help teachers revisit their past teaching experiences or reconsider their planned teaching activities. The questions of the reflective activity were underpinned by the complimentary questions of the curricular spider web (CSW) concepts. The reflective activities were collected from participants after a week to ensure that they had enough time to complete the activity. The semi-structured interviews were conducted three days after the reflective activities were collected. The three-day gap

allowed me (the researcher) to evaluate the participants' responses and plan the semi-structured interviews accordingly.

1.13.2 Semi-structured interviews (one-on-one interviews)

The semi-structured (one-on-one) interviews were employed to afford me a chance to probe the participants on their reflections of teaching topographical maps, generating in-depth and information-rich data. DiCicco-Bloom and Crabtree (2006) maintain that semi-structured interviews are in-depth and allow participants to articulate their views when probed by the researcher. Thus, the interviews allowed me to request clarity on the responses provided by participants. The interviews were also used to triangulate the generated data. I used the same questions that were used in the reflective activity. The interviews were conducted three days after the collection of the reflective activity. All the interviews were held after school whereby each interview lasted for more than forty-five minutes.

1.14 Data analysis

According to Wahyuni (2012), data analysis refers to drawing conclusions from generated raw data. Thus, it is the stage where the researcher has generated research data from participants and needs to analyse it in order to make sense of it. This study used a guided analysis approach to analyse geography teachers' reflections on teaching topography. This approach to data analysis uses deductive and inductive reasoning. Gibbs (2007) argues that a guided analysis differs from other data analysis approaches in the sense that it relies on pre-existing theories and concepts to draw meanings from the generated data. As such, the CSW concepts were used as themes for coding data during the deductive reasoning stage of guided data analysis. Samuel (2009) posits that a guided analysis is flexible as it allows researchers to modify or adjust theories based on the new trends that may emerge during inductive reasoning. Cohen et al. (2011) termed this technique as open coding. In this study, deductive reasoning was used to present and discuss participants' reflections on teaching topography while inductive reasoning was used to determine which CSW concepts addressed which research question. Elo and Kyngäs (2008) reveal that inductive reasoning is applied when there is a lack of previous theories or research findings to support the emerged themes.

1.15 Issues of trustworthiness

Trustworthiness is defined by Anney (2014) as the extent to which the methodological alignment of the research design, data generation, and data analysis, as well as data interpretation, is accurate, coherent, and honest to ensure the soundness of the study. Hence, Merriam (2009) argues that a study can only be considered trustworthy if it was carried out rigorously. Guba (1981), as well as Sandelowski (1986), reveal that paying attention to credibility, transferability, dependability, and conformability improve trustworthiness of a qualitative research study. Thus, this study ensured all four components of trustworthiness were considered.

1.15.1 Credibility:

Credibility, according to Graneheim and Lundman (2004), is concerned with ensuring that the findings of a study are not a distortion of the original data but an acceptable interpretation of participants' original answers. Thus, this study employed data triangulation to test the consistency of participants' opinions using different data generation tools. The findings were also sent to the participants for member-checking to ensure the original data from participants was not distorted. Thus, the participants themselves verified the interpretations of their opinions to ensure that they were accurate and honest.

1.15.2 Transferability:

Graneheim and Lundman (2004) view transferability as the applicability of the research findings to a different context or a group of people that were not involved in the original study. Meaning the findings of the study are not only applicable to the sampled population. The findings of this study are not to be generalised as it sampled a relatively small population. However, I provided thick descriptions of the study and participants so that researchers who may wish to apply the findings of this study to a different context are able to do that with caution.

1.15.3 Dependability:

Dependability is defined by Bitsch (2005) as well as Tobin and Begley (2004) as the constancy and stability of data if the research study is to be replicated under similar conditions. To account for dependability, I provided detailed descriptions of how the study was conducted, which data generation tools were used, and how the data was analysed. Thus, other researchers will follow the same methods when replicating this study.

1.15.4 Confirmability:

According to Baxter and Eyles (1997), confirmability in qualitative research is concerned with whether the research findings of a study can be corroborated by other researchers. More directly, Tobin and Begley (2004) contend that confirmability tries to establish that the findings of a research study are derived from the original data and are not figments of the imagination of the researcher. In this study, confirmability was ensured through repeated reading and analysis of the reflective activity to ensure participants' responses were not misconstrued. The semi-structured interviews were also recorded, transcribed, and listened to while reading the transcriptions to ensure that there were no discrepancies between the audio and transcriptions. Participants' responses to the interviews were interpreted several times to ensure that the conclusions did not represent any personal biases or predictions.

1.16 Ethical considerations

Rogers (1987) and Orb et al. (2001) define ethical issues or considerations as a set of moral principles that researchers must uphold when conducting research to ensure participants are protected and free from any sort of harm. Orb et al. (2001) further posit that failure to adhere to ethical standards may result in the study being rejected. For this study, I completed an online application from the University of KwaZulu-Natal Ethical Research Committee to have the proposal assessed for adherence to the ethical standards of qualitative research. After the ethical certificate was obtained, I sought and obtained gatekeeper's permission from the Department of Basic Education in KwaZulu-Natal to conduct the study in the sampled schools. Thereafter, the sampled schools were visited, and permission was sought from the school principals to recruit their geography teachers to participate in the study.

Furthermore, Vainio (2013) reveals that ethical issues in qualitative research are ensured by the use of informed consent forms, detailing participants rights and autonomy, and avoiding any measures that could deceive, harm, or exploit research participants. As such, when recruiting geography teachers to participate in this study, I verbally informed teachers of the reasons that propelled me to conduct this study (academic reasons and the rationale of the study in topography teaching). I further made participants aware of their rights during their participation in the study, which were also articulated in the informed consent forms that were given to them upon their agreement to partake in the study. This was grounded in Jefford and Moore (2008) argument that informed consent forms have two main objectives. One is to ensure participants are respected and take part in the study voluntarily. Secondly, to protect participants from potential harm that may arise from the study. Orb et al. (2001) opine the second objective can be achieved through confidentiality and anonymity. Thus, I made participants aware that any information they provided would be kept confidential, and their names would be replaced with Participant 1, 2, 3, and 4 to ensure their anonymity.

1.17 Limitations of the study

No research study is without limitations. Price and Murnan (2004) describe the limitations of a study as the systematic bias that the researcher did not or could not control, which could inappropriately affect the results of the study, threatening either the internal or external validity of the study or both. As I am also a geography teacher and have taught topographical maps, during interviews I was cautions not to ask leading questions or manipulate participants responses during data analysis to present my personal views as findings of the study. Another limitation of this study was the population size. It sampled only four geography teachers. Thus, its findings cannot be generalised but rather transferred with caution.

1.18 An overview of chapters

1.18.1 Chapter One: Background and orientation to the study

This chapter serves to introduce the reader to the situational context of topography teaching in South Africa that necessitated the study of this nature. It does this by declaring the purpose and focus of this study, which is to explore geography teachers' reflections on teaching

topography. It proceeds to capacitate the reader on the historical and contextual aspects of topography teaching. It further discusses the reasons (or rationale) which intrigued me to conduct this study as well as the problem statement which illustrates the state of topography teaching in South Africa. Thereafter, it presents the research objectives and the research questions that guided this inquiry. Finally, it highlights the literature review and the research design and methodology adopted by this study.

1.18.2 Chapter Two: Literature review

This chapter serves to capacitate the reader with the existing research on reflection as the conceptual phenomenon of this study (teachers' reflections). It accomplishes this through providing a discussion on reflection (what it is) and different frameworks of reflection (focusing more on the Van Manen model used as the framework to understand teachers' reflections in this study). Thereafter, it discusses deliberative and personalistic reflection. These are followed by the discussion of the challenges that impede teachers' reflections as well as the factors that influence teachers' reflections. This chapter also reviews the literature on the key curriculum concepts (intended, implemented, and achieved curriculum) that influence teachers' reflections. The chapter then concludes by provide a review of performance and competence curriculum approaches that influence teachers' reflection.

1.18.3 Chapter three: Contextualisation of the conceptual framework

This chapter serves to contextualise the CSW adopted as the conceptual framework of this study. It begins by providing a discussion on the CSW diagram. It persists in contextualising CSW by illustrating the reasons for which CSW was adopted as the conceptual framework of this study. Thereafter, all the ten concepts of the CSW diagram are discussed as well as their influence in topography teaching.

1.18.4 Chapter four: Research design and methodology

This chapter reveals how this study was conducted. It accomplishes this through illustrating the research design and methodology the researcher used to find answers to the research questions of the study. The interpretive paradigm in which this study is located is discussed in

this chapter. Subsequently, the chapter discusses the case study as the research design of this study and the qualitative approach as the research approach. Further, the convenience sampling strategy utilised in this study is explained. Thereafter, the data generation methods and data analysis approach are presented. The chapter concludes by outlining the limitations of this study, the ethical issues, and issues of trustworthiness.

1.18.5 Chapter five: Findings and data analysis

This chapter provides data presentation and discussion of findings. It discusses the data analysis plan that was used to analyse geography teachers' reflections on teaching topography and draw meanings or findings. In this chapter, the findings of the study are presented following the CSW concepts adopted as conceptual framework of the study. Thus, the CSW concepts are used as themes in presenting the findings of this study.

1.18.6 Chapter six: Conclusions and recommendations

This chapter provides the summary of the overall study. It also revisits the aims and objectives of this study. Thus, in this chapter, the research findings are used to address the three research questions (What are Geography teachers' reflections on teaching topography? What informs Geography teachers' reflections on the teaching of topography? and What lessons can be learnt from Geography teachers' reflections on the teaching of topography). This chapter concludes by providing suggestions for future research and recommendations.

1.19 Conclusion

This chapter illustrated my reasons for developing a keen interest in exploring geography teachers' reflections on teaching topography. These reasons were based on my personal experiences regarding the teaching of topography in some schools and the limited existing research in this aspect. This chapter has raised the need to understand how teachers reflect on their teaching of topography, what informs their reflections and what lessons can be learnt from their reflections so as to enrich the understanding of topography teaching state in schools. In doing so, it has presented the overall purpose of undertaking this study and has outlined the structure of the entire project. The next chapter will present the literature review on the conceptual phenomenon of this study (teachers' reflection).

CHAPTER TWO

The review of the literature

2.1 Introduction

This chapter presents the literature review on the conceptual phenomenon of the research topic of this study. This chapter begins by reviewing the literature on teachers' reflections as the phenomenon of this study. Thereafter, the intended, implemented, and achieved curriculum presentations are reviewed and their influence on teacher reflections are discussed. This chapter also reviews existing literature on performance and competence curriculum approaches that influence teachers' reflections. Denney and Tewksbury (2013) define the literature review as an overview of previous or existing research regarding a specific topic or phenomenon that is of interest to the reader. This overview highlights to the researcher the existing knowledge on a particular topic and the knowledge gaps, thereby illuminating the need for new studies to advance the existing research by filling in the outlined knowledge gaps (Denney & Tewksbury, 2013, p. 219). Thus, the literature review of a study should establish the significance of the study to which it is attached by advancing the known information. On the same line of thought, Marshall and Rossman (2014) concur that the literature review helps researchers connect their research studies to the ongoing discussions in the scholarly literature and contribute to new knowledge production by filling up literature gaps or extending earlier studies.

2.2 Unpacking phenomenon (reflection)

The concept of reflection was coined by Dewey (1933, p. 9), who defined it as “an active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and further conclusion to which it tends”. This suggests that reflection can be understood as a thoughtful examination of one’s own experiences in attempt to extrapolate meanings that underpin their experiences. In teaching, Schön (1987) described reflection as the thought process teachers engage in to understand and solve complex problems related to their practice. Similarly, Clarke (1995) and Walshe and Driver (2019) understand reflections to be a self-inquiry and exploratory process that teachers undertake to look back on their past actions to improve their future actions. Thus, there is consensus amongst scholars that the process of reflection is concerned with teachers examining the effectiveness of their teaching strategies, actions, and beliefs to improve their teaching and maximise teaching and learning experiences (Clarke, 1995; Schön, 1987; Walshe & Driver, 2019), and their perception of reflection is not different from that of Dewey (1933).

Dewey (1933) further presents three dispositions that inform effective reflection. These are open-mindedness, responsibility, and wholeheartedness. Zeichner and Liston (1987) show how these dispositions can inform reflection. In the context of teaching, open-mindedness warrants that teachers to engage in reflections open-mindedly, be conscious of their beliefs and assumptions about teaching and be open to new or different perspectives. Hence, Zeichner and Liston (1987) argue that teachers should engage in reflections voluntarily in order to be receptive to the responsibility that comes with reflections. Dewey (1933) posits that wholeheartedness means that teachers are thoroughly interested in their profession. Thus, devotion to their practice drives teachers to examine their practice with the aim of improving it. These dispositions seemingly suggest that teachers should not engage in reflective practice to validate their beliefs. Rather, they should be willing to change their beliefs and practice to suit learners’ needs.

Reflection has become widely recognised as the hallmark of teaching as it helps teachers improve their practice, ensuring quality education (Freese, 2006; Muchnik-Rozanov & Tsybulsky, 2019; Sutherland et al., 2010; Zahid & Khanam, 2019). Reflective teachers are able to plan, implement, and assess their teaching (Zahid & Khanam, 2019). Thus, reflections afford teachers the opportunity to examine their practices, identify their shortcomings, and take remedial action. Hence, Kheirzadeh and Sistani (2018) argues that reflective teachers are

conscious of their own performance, allowing them to judge if their teaching activities align with the curriculum objectives. In essence, reflections may help teachers develop the problem-solving capacity necessary for solving their day-to-day challenges in teaching.

While it is crucial for teachers to engage in reflective practice, there is confusion regarding how teachers should engage in this process. This is because scholars have suggested numerous frameworks for reflection. These include scholars such as Grimmett et al. (1990); Hatton and Smith (1995); Mezirow (1981); Taggart and Wilson (2005); Van Manen (1977); Valli (1997); Zeichner and Liston (1987), amongst others. The models offered by these scholars comprise different levels of reflection, while some provide the same number of levels. For instance, Van Manen's model has three levels: technical rationality (TR), practical action (PA), and critical reflection (CR). Taggart and Wilson (2005) later proposed a similar system but used different terminology, naming their levels as technical, contextual, and dialectical.

Furthermore, Fox et al. (2019) argue that Van Manen as well as Taggart and Wilson's models of reflection, are roughly parallel as there are many similarities between Van Manen's critical level and Taggart and Wilson's dialectical level. Contrary to Van Manen as well as Taggart and Wilson's systems, scholars such as (Grimmett et al., 1990; Hatton & Smith, 1995; Zeichner & Liston, 1987) have suggested four-levels models. A five-level model was offered by Valli (1997). While most models are made up of between three to five levels of reflections, a model developed by Mezirow (1981) presented seven levels of reflections. The variation in levels in the reflection models proposed by these scholars shows that there is no universally agreed-upon framework for reflection. This means that teachers may adopt whichever model they prefer and understand when reflecting on their practice.

Although different models of reflection proposing "new levels" have proliferated in an attempt to provide more clarity on the concept of reflection, Hatton and Smith (1995) cautioned against scholars' growing interest in developing new frameworks for reflections. They posit that the variation in the levels of reflection may be due to contextual factors, which will always differ. Leijen et al. (2012) echoed this argument by asserting that reflection

levels should be viewed as different viewpoints but on equal footage. This study employed Van Manen's model of reflection. Though this model is relatively old and does not offer new levels to the ongoing dialogue, it is easier to understand as it has clear characteristics (Fox et al., 2019). It is for this reason that this study employed Van Manen's model to explore geography teachers' reflections on teaching topography.

2.3 Levels of reflections in Van Manen's model

Van Manen (1977) defines technical rationality (TR) as a level of reflection that deals with teachers' application of educational knowledge. This suggests that from a technical reflection perspective, teachers are concerned about how they implement the intended curriculum. Hence, technical reflections are said to be driven by learning outcomes which determine the favourable means to implement the intended curriculum (Hatton & Smith, 1995). This requires teachers to have an adequate understanding of the curriculum itself (performance or competence) to decide on effective ways to communicate the curriculum to learners (Berkvens et al., 2014). As a result, Valli (1997) argues that technical reflection mainly focuses on the appropriateness of teaching methods, activities, and resources used by teachers in implementing and achieving the desired outcomes of the intended curriculum. This implies that from a technical rationality/reflection standpoint, teachers should reflect upon their practice by examining whether their preferred teaching styles align with the learning outcomes of the curriculum. For this reason, Taggart and Wilson (2005) postulate that technical reflection assists teachers in making justifiable decisions about their practice and building their professional knowledge.

The above assertions imply that, at the technical level of reflection, geography teachers should consider the learning outcomes of the curriculum (performance or competence) when teaching topography. This suggests that the ways in which geography teachers teach topography should be governed by the expectations of the CAPS curriculum. Therefore, the performance approach that informs the CAPS curriculum should manifest in their reflections (Khoza, 2015b). In other words, the roles geography teachers assume when teaching topography, the assessment approaches they use, the teaching activities they employ, as well as time and the environment in which they teach topography should be influenced by the performance approach (Hoadley & Jansen, 2013). This implies that the technical reflection

would allow geography teachers to match their practice to the proposed curriculum guidelines of the intended curriculum.

2.3.1 Practical reflections (PR)

Practical reflection is described by Van Manen (1977) and Hatton and Smith (1995) as the level of reflection concerned not only with the 'how to teach' question but mainly with the 'why teach' question. This suggests that practical reflection deals with the rationale or vision behind teaching a particular subject or topic (in this case: topography). In other words, practical reflection is concerned with the aims and objectives of the curriculum (Berkvens et al., 2014). Hence, Taggart and Wilson (2005, p. 4) argue that "the second level of reflection involves reflections regarding clarification of and understanding assumptions and predispositions of a classroom practice as well as consequences of strategies used". This suggests that in practical reflection, teachers reflect upon the teaching aims and objectives from which the curriculum, the type of curriculum, and teaching content are derived. Succinctly, Larrivee (2008) postulates that practical reflection involves teachers reflecting on the purpose of education, teaching theories, teaching methods, and the relationship between theory and practice.

The above assertions by the cited scholars suggest that practical reflection focuses mainly on the curriculum guidelines or principles (aims and objectives). This denotes that at the practical reflection level, geography teachers should apply their professional knowledge (gained through technical reflection) to understand the ideologies informing the inclusion of topography in the geography curriculum. Therefore, in this level of reflection, geography teachers should be concerned about the reasons why learners should be taught topography, why the topography curriculum is structured the way it is, why it has to be taught in a particular classroom setting, and why their preferred teaching methods may potentially be the effective approach towards achieving aims and objectives of the curriculum (Hatton & Smith, 1995; Van Manen, 1977). In other words, practical reflection may assist geography teachers in visualising the alignment between the aims and objectives of the topography curriculum and the learning outcomes that inform the topography curriculum or intended curriculum.

2.3.2 Critical reflections (CR)

Van Manen (1977) presents critical reflection as the final stage of his model. He defines critical reflection as the level of reflection in which teachers' concerns, unlike the other levels of reflection in his model, do not revolve around technicalities of teaching and learning but moral and ethical issues that inform the curriculum. The school and the curriculum are said to be influenced by politics (Valli, 1997). As a result, Taggart and Wilson (2005) posit that critical reflection requires teachers to be conscious of their practice and consider its effects in relation to equity and justice. Hence, Valli (1997) maintains that critical reflection is focused on understanding and improving the lives of the marginalised in society. In other words, critical reflection encourages social justice in education within the classroom and societal setting.

The above assertions by the cited scholars imply that at the critical level of reflection, geography teachers should consider external factors that directly or indirectly affect teaching and learning. This suggests that they should consider the curriculum's political agenda; learners' socio-economic background; the availability of resources; and other intrinsic or extrinsic issues that may affect learners' access to topography teaching. In other words, critical reflection offers geography teachers a way to critically examine whether their approaches to teaching topography are for inclusive and equitable education.

2.3.3 Deliberative and personalistic reflection

Extending on the work of Van Manen, Valli (1997) suggested two more levels that are deemed necessary in the field of education. These are deliberative and personalistic reflections.

Valli argues that deliberative reflection is whereby teachers consult multiple sources to make decisions about their practice. These may include sources like research, experience, colleagues, personal beliefs, values, and the culture of the school, among others. Thus, at the deliberative level of reflection, geography teachers would speak to other teachers to find out how they teach topographical maps or consult other sources (research). Hence, Valli argues that at the deliberative level of reflection, teachers not only listen to their inner voices but also consider the voices of others who might have experience.

Moreover, Valli (1997) argues that personalistic reflection is whereby teachers link their personal experiences to their professional lives to share valuable lessons that would help learners understand the importance of education. Thus, personalistic reflection encourages teachers draw life examples about how their identities and profession helped them accomplish their life goals. In other words, personalistic reflection can be linked with societal values. Therefore, from a personalistic reflective stance, geography teachers should demonstrate how the teaching outcomes of topography have helped them solve personal or societal problems, highlighting the importance for learners to learn such skills.

While some teachers may engage in all these levels of reflection in their practice at the end of delivering a lesson, Schon (1983) argues that reflections are time-bound and may take place during teaching and/or after teaching has occurred. Schon identified the two categories of reflection as reflection-in-action (during) and reflection-on-action (after). This suggests that teachers may reflect upon their teaching while they are teaching or after they have finished teaching. However, reflection during teaching is much more impactful because it allows teachers to correct their mistakes instantly and be conscious of the decision they take while teaching (Schon, 1983). This suggests that teachers should reflect on their actions while implementing the intended curriculum and after they have implemented the curriculum. Schon's argument of reflecting in and/or on action was later echoed by Khoza (2015b), who further suggested that reflections may occur before teaching takes place. Thus, teachers should examine whether their planned teaching activities are appropriately aligned with the intended curriculum and suitably cater for all learners before teaching occurs. Thompson and Pascal (2011) referred to this category of reflection as a reflection for action.

2.4 Curriculum presentations

There seem to be a consensus among scholars that reflection assists teachers in making sound decisions regarding curriculum implementation (Khoza, 2018; Taggart & Wilson, 2005; Van Manen, 1977). This suggests that there is a correlation between reflection and effective curriculum implementation. Thus, it is important to zoom in on what curriculum means. Hoadley and Jansen (2013) and Pinar (2012) define curriculum as a loanword taken from the

Latin “currere”, which means to run a course. However, some scholars have defined curriculum beyond its translation. For instance, Tatto and Bankov (2018) describe curriculum as the artefacts or manuscripts that outline what should be taught to whom, when, and how. On the same line of thought, Marsh (2018) views the curriculum as an official document that determines goals, objectives, content, teaching objectives, assessment, and instructional resources. Succinctly, Berkvens et al. (2014), as well as Khoza (2016), view curriculum as a plan for teaching (indicating the content that needs to be taught) or a plan of teaching (indicating how the content will be taught. Thus, these scholars concur that curriculum refers to any planned teaching activities developed by curriculum planners and designers from which teachers derive their everyday teaching activities. This suggests that reflection empower teachers to discern alignment between the intended curriculum (planned teaching activities) and their everyday teaching activities (implemented curriculum).

To simplify curriculum even further, Thijs and Van Den Akker (2009) suggest five curriculum levels that dictate what is taught in schools. These scholars argue that the content taught in schools is determined by international curriculum standards. This is called the supra curriculum. Each country then designs its own curriculum based on the international curriculum. This is called the national curriculum. The national curriculum is then dissipated in all schools and is implemented according to the institutional values of beliefs of that school. This is called the school curriculum. Teachers interpret and implement the school curriculum. This is called the classroom or teacher curriculum, and it is where teacher reflection happens. Teachers’ interpretations of the school curriculum are what is received by learners, and this is called the learner curriculum (Thijs & Van Den Akker, 2009). Evidently, these curriculum levels are vertically interlinked. Thus, the upper levels dictating what transpires in the lower levels (Thijs & Van Den Akker, 2009). This suggests that at the school curriculum level, teachers should reflect upon their practice to discern whether their planned teaching activities align with the upper levels of curriculum. As a result, this positions teacher reflection as an important aspect in teaching that may encourage teachers to match their practices to the expectations of the intended curriculum.

Furthermore, curriculum is also presented in three different layers upon which teachers need to reflect. These are the intended (planned or prescribed curriculum), which Khoza (2015b)

defines as an official policy; comprising ideas underpinned by educational goals and theories to be imparted to learners. The second layer is the implemented, enacted, executed, or practised curriculum. The implemented curriculum deals with teachers' interpretations or conceptualisations of the intended curriculum (Khoza, 2015b). The final layer is the attained, achieved or assessed curriculum. This curriculum layer is concerned with the achieved teaching outcomes measured through assessments (Khoza, 2015b). Further, Khoza (2015b) suggests that teachers must reflect upon their teaching (implemented curriculum) to ensure that their preferred ways of teaching do not cause a mismatch between what is intended (national curriculum) and what is achieved (classroom curriculum). This suggests that reflections serve as primary means for teachers to identify problems in their teaching that might negate the intended curriculum.

The intended curriculum is defined by Kuiper et al. (2013) and Van den Akker et al. (2003) as an educational ideology that outlines the goals and expectations set by curriculum designers and developers to determine what is taught in schools of one nation or organisation, influencing the content of textbooks or official syllabi. Van den Akker et al. (2003), as well as Van den Akker et al. (2010), argue that the intended curriculum of one country is usually in line with the international educational system (macro level). The intended curriculum is divided into two forms: the ideal and the formal curriculum (Phaeton & Stears, 2016). On one hand, the ideal curriculum comprises all the original ideas from curriculum developers and designers about which skills, knowledge, and values should be taught to learners and why learners need to be taught those pieces of knowledge (Thijs & Van Den Akker, 2009; Van den Akker et al., 2003). As a result, Van den Akker et al. (2003) refers to it as an ideological domain and argues that it is influenced by the beliefs and values of people outside the schooling system. This suggests that the ideological domain encourages teachers to engage in practical reflection. This implies that geography teachers may reflect on the intended curriculum (topography) to understand the values and beliefs that underpin its subject matter. On the other hand, the formal curriculum comprises of the formal ideas from curriculum developers and designers that have been written down to produce teaching documents which are disseminated to schools (Phaeton & Stears, 2016). This suggests that the formal curriculum is derived from the ideal curriculum. As such, formal curriculum can be understood to refer to all the official documents developed by curriculum planners and developers and approved by the government to be used in schools for teaching, such as

curriculum policies, textbooks, teachers guide and other official documents (Van den Akker et al., 2009; Van den Akker et al., 2003). This suggests that the formal curriculum is the intended curriculum from which teachers derive what, when, and how to teach (implemented curriculum).

In contrary, Phaeton and Stears (2016) define the implemented or practised curriculum as what constitutes the subject content, pedagogical strategies, and time allocations which guide teachers in terms of how the intended curriculum is to be implemented at the meso-level or in schools. This illuminates the interrelation between these levels of curriculum. Similarly, the implemented curriculum is also viewed in two forms, the perceived and the practised curriculum. The perceived curriculum is understood as teachers' understandings and interpretations of the intended curriculum (Khoza, 2018; Thijs & Van Den Akker, 2009; Van den Akker et al., 2003). Khoza (2018) further opines that teachers' interpretations of the intended curriculum are influenced by their values, beliefs, and assumptions about teaching and learning. Thus, the way they perceive or understand the intended curriculum is how it is implemented in schools or classrooms, and this is called the practised curriculum. Kuiper et al. (2013) define the practised or operational curriculum as teachers' ability to interpret the ideas of curriculum developers and designers and put them to practice in an attempt to achieve the teaching outcomes of the intended curriculum. This suggests that teachers reflect upon the intended curriculum to conceptualise it and implement it as they understand it and reflect upon their implementation. Whereas teachers who do not reflect upon the intended curriculum may not be as effective in understanding the intended curriculum and communicating it to learners.

The final level of curriculum is the attained or experiential curriculum. The attained curriculum is defined by Thijs and Van Den Akker (2009); Van den Akker et al. (2003); Van den Akker et al. (2010) as the change in learners' behaviours after the implementation of the planned teaching and learning activities. On the same line of thought, Ennis (1990) maintains that the attained curriculum involves the interaction between the learner and the learning material under the supervision or facilitation of a teacher as a mediator to ensure the teaching and learning activities are appropriately carried out for the achievement of the teaching outcomes. Succinctly, the attained curriculum refers to the skills and knowledge teachers

impart to learners. Teachers measure these skills through assessment. This suggests that teachers can use assessment as means to reflect upon their teaching in an attempt to gauge their efficacy.

The organisational structure of the intended, implemented, and attained has been criticised by scholars such as (Phaeton & Stears, 2016; Sethole, 2004; Thijs & Van Den Akker, 2009; Van den Akker et al., 2003). While these scholars seemingly acknowledge the rationality behind how these curriculum levels are structured, but they are not oblivious to the demerits this structural organisation of curriculum levels presents to quality education. They argue that curriculum implementation may be fraught with problems as teachers' interpretations of the intended curriculum may not be accurate, leading to curriculum distortion at each level. Sethole (2004) argues that the misalignment in curriculum implementation may be due to the fact that curriculum planners and implementers are confronted with different problems pertaining to education. As a result, what is prescribed in the policy document may not always be what is implemented in the classroom context (Jansen, 2001). This requires teachers to continuously reflect on how they implement the curriculum and how they are expected to implement the curriculum. Geography teachers' reflections on teaching topography may elucidate how teachers ensure alignment between the intended and the implemented curriculum.

2.5 Types of Curricula models

As multifaceted as curriculum seems to be, Bernstein (1975b) contends that there are only two frameworks used for curriculum development. These are competence-based and performance-based approaches to curriculum. Nevertheless, although curricula of different countries may vary greatly, the way they are designed may be grounded on either competence-based or performance-based approach. As such, teachers' reflections' on teaching topography may be influenced by the type of curriculum approach they teach. Hoadley and Jansen (2013) revealed that competence-based and performance-based approaches differ in terms of teacher control over the curriculum, teacher role in delivering the curriculum, the focus (teacher or learner-centred), the type of knowledge prioritised

(every day or school), how assessment is conducted and the prescribed learning space and pace. As a result, how teachers reflect on these aspects of the curriculum depends on the philosophies underpinning the two approaches. In a competency-based curriculum, teachers' reflections customarily concern contextualisation of the curriculum as teachers are required to teach competencies deemed important in society (Palsa & Mertala, 2019). This suggests that teachers' reflections are influenced by societal rationale, which encourages critical reflection. Contrary, Khoza (2015b) found reflections of teachers who were implementing a performance curriculum (CAPS) to be heavily focused on CAPS specifications – as the CAPS curriculum is content driven. This suggests that the performance curriculum necessitates technical and practical reflections as it is mainly focused on curriculum implementation rather than enactment. As such, it is important to zoom in on these two curricula approaches and how they may influence geography teachers' reflections.

2.5.1 Competence-based/integrated curriculum.

Whiddett and Hollyforde (2003) see competency as an ability to develop the application of knowledge and skills as well as learned values and attitudes. Hence, Ndihokubwayo and Habiyaremye (2018) view competence-based curriculum (CBC) as a curriculum centred on learners' application of knowledge and skills necessary for active participation in society when they become adults. In the same line of thought, Wesselink et al. (2006) postulate that the CBC is constructed based on the skills that learners should demonstrate at the end of the course or the period of study to benefit society or communities. Thus, the CBC can be seen as a learner-centred and adaptive curriculum approach, designed to assist learners in recognising their potential in combating personal and societal needs. For this reason, Ndihokubwayo and Habiyaremye (2018) stipulate that the primary purpose of a CBC is addressing the aspirations of society and learners in relation to contemporary problems. This suggests that geography teachers enacting a CBC should reflect on their practice from a critical level to understand how the teaching of topography may be advantageous to society. Thus, teachers' reflections should not only be delimited to the school context. But teachers also need to consider how their practice influences society.

There are significant elements that set apart the CBC from the performance-based curriculum (PBC). In the competence-based curriculum, teachers are expected to nurture learners' knowledge and abilities rather than imposing it (Hoadley & Jansen, 2013). This suggests that CBC is influenced by constructivism where knowledge is produced inside out instead of outside in (Vygotsky, 1978). As such, in the CBC, teachers should allow learners to drive the curriculum by deciding what they learn (selection), how they learn (sequence), and how quickly they progress through the learning (pace) (Hoadley & Jansen, 2013). Teachers' responsibility then becomes developing learners' confidence to ensure that learners are able to take charge of their learning (Hoadley & Jansen, 2013). Hoadley and Jansen (2013) further aver that teachers also need to realise that not all learners will achieve independence at the same time. Thus, teachers may need to scaffold learners depending on their needs and abilities. This suggests that teachers' reflections on the time they dedicate to teaching topography may also be influenced by the expectations of the curriculum approach that underpins the curriculum.

Furthermore, Hoadley and Jansen (2013) declare that the role of a teacher in CBC is that of a facilitator, as teachers are expected to let learners take charge of their learning. This suggests that teachers should use learner-centred strategies when implementing a CBC. Hoadley and Jansen (2013) also note that within the CBC, teaching is not confined to a specific environment but may take place anywhere. This suggests that geography teachers should teach topography in a way that will allow learners to see that topography is something that they experience every day. Hence, Hoadley and Jansen (2013) further assert that in CBC, knowledge is horizontally organised into themes and problems that are interconnected and argue that teachers must incorporate everyday knowledge when implementing a competency-based curriculum. This suggests that teachers must consistently reflect upon their teaching activities to understand if they relate to learners' experiences. In other words, geography teachers' reflections on teaching topography should focus on whether or not the teaching activities they use are contextually relevant.

As previously alluded to, another significant factor that distinguishes the two curriculum approaches is the assessment approach used in these curriculum frameworks. Hoadley and Jansen (2013) posit that the competence-based curriculum focuses on presence, while the

performance curriculum focuses on absence. This suggests that under the competence curriculum, teachers administer assessments to ascertain what teaching outcomes they have managed to achieve. For this reason, it can be said that teachers focus on progress rather than the shortcomings of their teaching. Thus, in the competence-based curriculum, the assessment is conducted with the aim of measuring which educational goals, aims, and objectives teachers have managed to achieve in curriculum enactment. Therefore, reflections may help ascertain how geography teachers understand the nature of assessment in the CBC.

In the South African context, the competence approach to curriculum had been used to drive several curriculum reforms implemented after the abolishment of the racially-polarised education system of the apartheid government (Ballantyne, 1999; Harley et al., 2000; Jansen, 1998; Nsengimana et al., 2020). The competence-based approach to curriculum was adopted in the form of transformational OBE (Outcome-Based Education) (Jansen, 1998; Taylor, 1999). Scholars such as Khoza (2015b), as well as Ruth and Ramadas (2019), identify three curriculum reforms that were modelled on the OBE framework, namely Curriculum 2005, the Revised National Curriculum Statement (RNCS), and the National Curriculum Statement (NCS). All these curriculum reforms were adopted to transform learners into highly competent individuals to meet workforce standards (Botha, 2002). As such, these reforms were driven by the constructivist theory. This suggests that for teachers to reflect on their curriculum implementation within the OBE framework, societal needs were to be taken into consideration. This is achieved through critical reflection. However, teachers' reflections in the study conducted by Mulaudzi et al. (2014) to understand how teachers reflected on their conceptualisation and utilisation of the OBE notes that teachers' reflections concerned the technical application of the curriculum. This suggests that teachers were not adequately trained to enact the OBE curriculum.

In addition to the above, more studies have explored how teachers reflected on the OBE-modelled curricula (Du Plessis & Marais, 2015; Du Plessis & Letshwene, 2020; Singh & Singh, 2012). These studies note that teachers' reflections concerned the technical rationality of the OBE, as their reflections show that teachers were dissatisfied with how the OBE curricula were structured. For instance, Du Plessis and Marais (2015) found teachers were discouraged from implementing the NCS curriculum due to the lack of content specifications

as well as the overlapping and repetitive content in this curriculum reform. This suggests that teachers did not reflect on the visions that might have necessitated the structural organisation of the NCS curriculum. Further to this argument, Du Plessis and Letshwene (2020), as well as Singh and Singh (2012), note that teachers felt overburdened with the curriculum reforms from C2005 to RNCS. Due to this reason, some had decided to disregard new reforms as they meant more workload and administrative work for teachers. This further illuminates how teachers' inability to engage in critical reflection proved detrimental to curriculum enactment. Thus, reflecting on the teaching of topography in geography education may help teachers understand the importance of this topic and subsequently improve their practice.

2.5.2 Performance-based curriculum

The performance-based curriculum (PBC) is in opposition to the competence-based curriculum (CBC). As such, the two approaches are usually defined through juxtaposition. Bernstein (1975b) defines the PBC as an approach that aims to develop high levels of understanding in a particular subject. Therefore, this approach is characterised by strongly classified and vertically arranged knowledge (Bernstein, 1996; Van Harmelen, 1999). Thus, contrary to the CBC, the PBC is very specific about content selection (which knowledge to teach to learners) as well the order in which this knowledge has to be presented to learners (when and how to teach particular knowledge) (Bernstein, 1971, 1996). This seems to suggest that teachers have less autonomy in the PBC as they must adhere to curriculum prescriptions when teaching while in the CBC teachers are able to transform and contexualise the curriculum to suit a specific environment. However, Khoza and Manik (2016) caution that too much dependence on the intended curriculum encourages technical reflections and makes teachers teach in a "programmed robotically" way. To avoid this, Khoza (2016) recommends that teachers reflect from all levels of reflections, so they can consider alternatives for achieving the same curricular visions more effectively and also consider the contextual factors which the national curriculum fails to do. This suggests that critical reflection may help teachers adjust the curriculum to suit learners' needs.

Furthermore, Bernstein (1996) argues that the performance-based curriculum privileges depersonalised formal school knowledge over everyday knowledge and experiences. This enforces the vertical organisation of knowledge through which the PBC is characterised. In

other words, within the PBC, the learning themes and problems build up on top of each other in a specific sequence and become more intricate as the learning continues, enforcing high levels of knowledge as suggested by Bernstein (1975b) as well as Bernstein (1996). This seems to suggest that reflections may help geography teachers understand how topography is compartmentalised in relation to other geography concepts. Therefore, the way in which geography teachers reflect on their teaching of topography may illuminate how they position topography in the geography syllabus in relation to other concepts.

In addition to the above, Bernstein (1975b) maintains that the teacher's role is overt in the performance-based curriculum. Meaning that teachers have more control over the curriculum matters than the learners, which is the opposite of the competence approach. This suggests that within the performance curriculum, teachers dictate what is taught (content selection), how it is taught (sequence), and when learners are expected to have grasped the formal knowledge (period of teaching). Teachers make all these decisions in adherence to the curriculum policy that guides their teaching. In other words, the performance curriculum is content-driven and teacher-centred. As a result, teaching is confined to a specific learning environment designed for formal schooling, such as classrooms, laboratories, and training workshops and occurs as prescribed in the intended curriculum. For this reason, Mpungose (2020), who conducted a study exploring teachers' reflections on their experiences and practices of using digital resources in teaching Grade 12 mathematics under CAPS, concurs with their earlier sentiments offered by Khoza (2016) that the nature of the PBC make teachers lean heavily on the intended curriculum when they reflect on their teaching, signalling technical reflections. However, Mpungose (2020) acknowledges that the PBC does not delimit teachers to reflect from one level (technical reflection) as other teachers were able to bring in their personal and societal experiences in their reflections. This suggests that the reflections of those teachers were influenced by personalistic and critical reflection levels.

In contrast to how assessment is understood within the competence-based curriculum, Bernstein (1975b) argues that in the performance-based curriculum, teachers administer assessment activities to ascertain their shortcomings in achieving the educational goals, aims, and objectives. For this reason, it can be understood that assessment within the performance approach tries to establish what teachers failed to achieve rather the achieved curriculum (Bernstein, 1975b). This suggests that within the performance-based curriculum, teachers use

teaching outcomes to measure their success in implementing the intended curriculum (Hoadley & Jansen, 2013). Therefore, teachers' reflections on the teaching of topography may help ascertain how geography teachers use teaching outcomes in formulating assessment activities.

Furthermore, Khoza (2015b) declared that the performance-based curriculum was adopted through the implementation of the Curriculum Assessment Policy Statement (CAPS). The CAPS curriculum is the latest reform in South Africa implemented in 2009. In contrast to earlier reforms built on constructivism which encouraged critical reflection, the CAPS curriculum employs behaviourism by establishing predetermine behaviours that learners ought to demonstrate at the end of their learning (Ontong & le Grange, 2020). As a result, the CAPS curriculum (underpinned by the performance-based approach) is very strict in terms of how teachers teach (Le Grange, 2013). This makes teachers who are not educated on reflections reflect on their teaching from the technical level, for the most part, as their primary concern is implementing the CAPS curriculum as specified in the intended curriculum.

2.6 Challenges associated with reflections.

Although it is universally acknowledged that reflection is a crucial part of teaching, enabling teachers to execute their teaching duties effectively, literature shows that various challenges deter teachers from engaging in reflections. This has been confirmed by numerous studies gauging the reflectivity of teachers (Ann et al., 2018; Ngololo & Kanandjebo, 2021; Soodmand Afshar & Farahani, 2018; Sunra & Nur, 2020). One of the egregious challenges to reflective teaching is teachers' insufficient training and knowledge of reflective practice (Bharuthram, 2018; Soodmand Afshar & Farahani, 2018). For this reason, Ngololo and Kanandjebo (2021) conclude that many undergraduate programmes seemingly do not thoroughly train prospective teachers on reflections, leading to their inability to reflect critically or having skewed conceptions about reflections. Bharuthram (2018) posits that some prospective teachers view reflection as a concept that must be studied to satisfy course requirements rather than a life-long learning strategy that requires conscious engagement. This means that prospective teachers do not invest in understanding the concept of reflection as they are seemingly convinced that they will not need it in their practice.

In addition to the above, Soodmand Afshar and Farahani (2018) revealed that teachers with higher degrees usually exhibit decent knowledge and skills in reflections than teachers with undergraduate degrees. This suggests that many teacher preparation institutions take reflections more seriously at the postgraduate level rather than at the undergraduate level. As a result, Kharlay et al. (2022) as well Sunra and Nur (2020), found reflections of many teachers to range from the technical and practical level, with a finite number of teachers reflecting from the critical level. As a result, Ann et al. (2018) and Bharuthram (2018) recommend that there should be a paradigm shift in the way reflective practice is taught in teacher education programmes. They argue that teacher educators must provide more support to prospective teachers, as well as identify what misconceptions prospective teachers may have about reflective practice, and prompt them to realise the importance of reflection in teaching.

Furthermore, Seedat (2019) found that teachers may also be discouraged by the lack of time and their workload to reflect. This seems to suggest that some teachers view reflections as a concept confined to the school setting. Similar findings have been reported by Donyaie and Afshar (2019), who conducted a case study in Iran to understand teachers' barriers and boosters to engage in reflections. These scholars found the main obstacle to teacher reflections to be the laborious workload that teachers must carry out, which includes teaching, administration, pressure from the school managers, and completing the syllabus on time. They outline that though some teachers engage in reflections, they reflect on their practice only to identify classroom problems. Thus, they do not invest in working out solutions. This suggests that some teachers may be aware of the importance of reflections in teaching but may choose not to engage in reflections adequately because of the responsibility it entails. Thus, the level at which teachers reflect on their practice may be influenced by intrinsic or extrinsic factors.

2.7 Factors shaping teachers' reflections.

The challenges experienced by teachers in engaging in reflective teaching have attracted the attention of many scholars from different corners of the world. As a result, some scholars

have focused their attention on exploring ways in which teacher reflections can be promoted in schools and the factors that shape teacher reflections. These include scholars like Wright and Park (2004); Hilal et al. (2022); Jenkins (2020), among others. Herein, the influence of these factors on teachers' reflections is reviewed based on the existing literature.

2.7.1 Family Background

A case study conducted by Khoza (2016) to explore postgraduate students' understanding of curriculum visions and goals in their teaching subjects shows that the reflections of the two participants, from whom the findings were deduced, were heavily influenced by beliefs and values they inherited from their families. The beliefs and values formed the basis through which teachers delivered the curriculum. This suggests that family background plays a huge role in the way teachers teach and reflect on their teaching. Evidently, family background manifests differently in teacher reflections, depending on teachers' learned beliefs and values. For instance, one teacher's reflections in the study conducted by Khoza (2016) were driven by personal and societal visions, as the teacher believed in being inquisitive and channelled learners towards the same values. This encouraged critical reflection. However, the reflections of the other teacher, whose upbringing was centred on obedience, were influenced by the personal and discipline rationale. This implies that this teacher was worried about implementing the curriculum as envisaged. This necessitated technical reflections for the teacher. These findings suggest that beliefs and values influenced how teachers taught and reflected upon their practice. Similarly, Vartuli (2005) maintains that beliefs and values inform how teachers engage in reflections, what they make of their reflections and the decisions they make after that. This suggests that the beliefs and values of teachers become part of their profession.

2.7.2 Teacher Professionalism

Demirkasımoğlu (2010) defines professionalism in education as a teacher's ability to improve their practice by learning new skills, ideas, values, beliefs, and theories to guide their teaching. Thus, for teachers to develop and improve their professionalism, they ought to engage in reflections to assess and re-assess their philosophies of teaching (Simoncini et al., 2014). This way, teacher professionalism propagates teacher reflections and vice versa. This

suggests that geography teachers' reflections on teaching topography may signal teacher interest in improving their professionalism with the aim of ensuring quality teaching. Darling-Hammond et al. (2007) argue that teachers who continually reflect on their practices, actions, and experiences can learn from their past teaching episodes and gain new skills and ideas to improve their future teaching episodes. Similarly, Simoncini et al. (2014) maintain that as teacher professionalism intensifies, so do teacher reflections. This suggests that teacher professionalism promotes critical reflection. Conversely, teachers with relatively poor teaching skills may not be able to reflect critically upon their practice. However, this is subject to change as teacher professionalism improves with time (Franey, 2016). This is evident in the study conducted by Zhukova (2018) to explore the professionalism of novice teachers and their reflections. The study found professionalism to be influenced by time and experience. Novice teachers were found to reflect mainly from the technical reflections as they were new in the profession and trying to adapt. However, the same teachers exhibited critical reflection in the second data generation period, as this was a two-year study. The study notes that teachers had gained confidence in their teaching. Rather than just reflecting on whether they were implementing the curriculum accordingly, eventually, they reflected to find innovative ways to deliver the curriculum to improve education quality. This suggests that geography teachers' reflections on teaching topography may help ascertain how they (geography teachers) feel about teaching topography (or geography as a subject).

2.7.3 Teacher Identity

Teacher identity is defined by Sachs (2005) as professional traits learned and adopted by teachers that determine what kind of a teacher they are and how they understand their work and place in society. Teacher identity is created and recreated based on competing interactions between personal, professional, and situational factors (Day et al., 2007). This suggests that teacher identity is developed through consistent reflection on self, the profession, and the context in which teachers work. This suggests that teacher identity may propel geography teachers to reflect upon the intended curriculum (topography) to visualise how their professional qualities and circumstances at school may influence the teaching of topography and thereafter, adopt certain teaching qualities that align with who they are; what is required by the intended curriculum (aims and objectives), and what is needed by learners

and the society. This is what Khoza (2015b) termed reflection for teaching, where teachers reflect on the planned teaching activities to understand their effect on the teaching process.

Moreover, Jansen (2001) suggests that it is important for teachers to reflect upon their teacher identity and the intended curriculum. This is because different identities of different teachers and dissimilar circumstances in schools are not accounted for in the intended curriculum. Rather, policymakers assume a particular "teacher image" and use that image as a framework to inform curriculum decisions. This results in a dissonance between policymakers' ideas of who teachers are; how they should teach; and of what teachers actually think of themselves and how they understand teaching (Jansen, 2001). This suggests that teacher identities are not accounted for in the curriculum. As a result, critical reflection offers a way for teachers to negotiate their different identities in the curriculum and tailor the curriculum implementation according to different teaching circumstances in their schools.

Furthermore, Beijaard et al. (2000) identify three categories under which teacher identities can be grouped. Namely, the subject matter expert (focusing on transmitting knowledge and correcting misconceptions), the didactical expert (focusing on designing, planning, and evaluation of teaching), and the pedagogical expert (based on knowledge and skills to support social, emotional, and moral development). These teacher identity categories align with technical, practical, and critical level, respectively. This is evident in the qualitative case study conducted by Özüdogru (2021) on pre-service teachers to understand the relationship between teacher identities and reflections. This study notes that teacher identities manifested in teacher reflections differently. Teachers who possessed subject matter expert and didactical expert identities showed insufficient reflection knowledge. This seems to imply that these identities encouraged technical and practical reflections. While the pedagogical expert identity encouraged critical reflections as teachers who possessed this identity exhibited adequate knowledge of reflections. In essence, this suggests that teacher identities of geography teachers may influence how they reflect on their teaching of topography.

2.7.4 Teacher Agency

One cannot delve into teacher reflections without discussing teacher agency. Many scholars have found teacher agency to be the driving force behind teacher reflections (Jones & Charteris, 2017; Kennedy, 2005; Leijen et al., 2020). Jenkins (2020) defines agency as teachers' potential, ability, or capability to influence curriculum change in the classroom, school, or even at the departmental level in an attempt to achieve a desired outcome. This definition shows that teacher agency allows teachers to transform teaching or the curriculum. Succinctly, Kennedy (2005) and Brookfield (2017) maintain that agency calls for teachers to critically reflect upon the intended curriculum by questioning its theories, philosophies, and values before making any adjustments to the curriculum. This confirms agency as the driving force for reflection, and the two work together to bring about a solution (curriculum adjustment). Thus, teacher agency encourages critical reflection.

Furthermore, Jenkins (2020), who conducted a qualitative study to explore how teacher agency manifested in teacher reflections during a time when teachers were engaged in the process of developing or adapting school, department, and classroom curricula in their schools, suggests that not every teacher can reflect critically upon their practice. The study notes that proactive teachers reflect critically upon the intended curriculum and implement necessary adjustments in the curriculum. Leijen et al. (2020) and Nguyen (2019) concur with Jenkins that proactive agency encourages critical reflection. Whereas teachers characterised with the reactive agency, adhere to directives when implementing the curriculum. This suggests that reactive agency encourages technical reflection, as Jenkins (2020) shows that reactive teachers reflected upon their teaching to evaluate whether their actions aligned with the instructions from the school managers. Further, the study notes that passive agency does not propagate teacher reflections. Teachers characterised with passive agency discard curriculum changes. These findings suggests that geography teachers' reflections on teaching topography may be influenced by the type of agency that drive their teaching.

2.7.5 Economic, political, and cultural factors.

According to Boud and Walker (1998), one of the important things for teachers to consider when reflecting on teaching is the context, which constitutes economic, political, and cultural factors, amongst other things that influence the curriculum. These scholars argue that the context profoundly influences the curriculum itself and how teachers enact it. They argue that

the context of the communities in which schools are located dictates the language of instructions used by teachers and the knowledge deemed acceptable for teachers to teach. These are determined by the people who have more resources than others and control how education is delivered. This suggests that teaching can be perceived as means to serve the status quo in societies. As a result, Boud and Walker (1998) argue that it is important that teachers reflect on these factors (economic, political, and cultural) to understand how they manifest in curriculum and in their teaching. These scholars argue that reflecting upon the factors may enable teachers to challenge the curriculum and ensure that everyone is equally accommodated during teaching, irrespective of the diversity among them. It is through critical reflections that teachers may be liberated on the influence of context on teaching (Boud & Walker, 1998). This is evident in the study conducted by Acquah and Commins (2015) to help pre-service teachers understand the dimensions of diversity and how power, privilege, and social status influence teaching, amongst other things. The study sampled forty-five prospective teachers from twenty-two different countries with vast differences in terms of socio-economic and political factors. The study notes that pre-service teachers who reflected critically on education in their respective countries were liberated from the lack of inclusivity in education. This suggests that geography teachers' reflections on teaching topography may assist in understanding how teachers navigate teaching topography to learners from diverse socio-economic backgrounds.

2.7.6 School culture and reflections

Peterson and Deal (2009) define school culture as a complex set of rituals, folkways, and values that shape the behaviour and relationships of teachers in school and are distinct and unique to a particular school. According to Schein (2010), school culture includes visible artefacts, values that govern teachers' behaviour and the rationale for their actions, and the assumptions through which the values are constructed. This suggests that each school has a responsibility to develop its own culture. As such, reflective practice can become part of the school culture if school leaders encourage teachers to engage in reflections (Barnett & O'Mahony, 2006). School leaders may promote teacher reflection by implementing reflective measures such as reflective questioning strategies, action research, and reflective diaries. Through these activities, teachers can begin to reflect upon their teaching individually and collectively, strengthening the sense of collegiality in schools (Barnett & O'Mahony, 2006).

This suggests that the school culture has a significant influence on whether teachers engage in reflection. Thus, geography teachers' reflections on teaching topography may help provide more evidence on how school culture influences teacher reflections.

2.7.7 Curriculum management

Jenkins (2020) argues that the way in which curriculum is handed down to teachers, who are the key role players in the curriculum implementation, has a significant influence on how teachers implement the intended curriculum. Similarly, Hilal et al. (2022), who conducted a quantitative study exploring the effects of teacher involvement in curriculum-making decisions, particularly in encouraging teacher agency and reflective practice, note teacher involvement in curriculum decisions encourages teachers to reflect upon their teaching and assume proactive agency. This suggests that the decentralisation of power in curriculum matters directly influence teacher reflections. This has been confirmed by the work of Carl (2005), who also explored teacher participation in curriculum development at a departmental and national level in the study titled "the voice of teachers in curriculum development". In the study, the author concludes that teacher involvement in curriculum development would allow teachers to reflect on their teaching experiences. This implies that geography teachers' reflections on teaching topography may be directly or indirectly influenced by the leadership approach used by curriculum managers at their schools. Khoza (2015b) advocates for teachers' inclusion in curriculum development as they serve as an interface between the three types in which the curriculum is presented (the intended, implemented, and achieved curriculum). Thus, teachers are the only ones who interact with all three curriculum presentations. Therefore, it is of paramount importance to provide a scope of curriculum presentations to understand how they shape the teaching process and teachers' reflections.

2.8 Conclusion

The literature represented has discussed reflections according to the research questions and objectives of this study. The literature has also discussed the curriculum levels (the international, national, institutional, teacher curriculum and learner curriculum), the three curriculum layers (intended, implemented and attained curriculum) and the two curriculum

models that influence teacher reflection (competence and performance curriculum). The next chapter discusses the conceptual framework that guided this inquiry.

CHAPTER THREE

Conceptual Framework

3.1 Introduction

The previous chapter outlined the existing literature on the phenomenon of this study (teacher reflections). It highlighted the reflection framework underpinning this study, the levels of reflection, the challenges associated with teacher reflections, and factors shaping teachers' reflections. This chapter discusses the conceptual framework this study adopted to explore geography teachers' reflections. It begins by explaining the conceptual framework and highlighting the relevance of the CSW as lenses through which geography teachers' reflections on teaching topography are explored. Thereafter it provides descriptions of all the concepts that make up the CSW diagram (rationale, accessibility, goals, content, teaching activities, teacher role, resources, location and time, and assessment) and contextualises them in respect to teacher reflections. This chapter concludes by summarising all the ideas discussed in this chapter.

3.2 Defining the conceptual framework.

Camp (2001) describes a conceptual framework as the related concepts of a theory that explain a problem or phenomenon. Similarly, Osanloo and Grant (2016) argue that the conceptual framework shows the researcher's understanding of how a problem should be investigated, the direction the research should take place, and how different variables in the study relate to one another. This seems to suggest that there should be a correlation between the conceptual framework used in a research study and the problem being explored. In addition to that, Varpio et al. (2020) argue that the conceptual framework also outlines what is already known about the phenomenon through literature reviews, shows where there are gaps in the literature, and further provides the methodological underpinnings of a research study. As a result, this study employed its conceptual framework to guide the literature review relating to geography teachers' reflections on teaching topography.

The current study used curricular spider web (CSW) framework designed by Van den Akker et al. (2009) as the conceptual framework. There ten concepts that make up the CSW diagram. These are: teaching rationale, accessibility, aims and objectives, content, teaching activities, teacher role, teaching resources, location, time, and assessment. These concepts are inter-connected and influences one another. Each concept of the spider web has a complementary question outlining the concern of that concept. The following are the complementary questions of the spider web used to provide clarity on teach concept: why are they teaching (rationale); how do they access teaching (accessibility); which goals are they teaching towards (aims and objectives); what are they teaching (content); how are they teaching (teaching activities); how do they facilitate teaching (teacher role); what are they teaching with (teaching resources); when and where are they teaching (location and time); how do they assess their teaching (assessment) (Van den Akker et al., 2009; Van den Akker et al., 2003). Additionally, Berkvens et al. (2014) supplemented the ten concepts of the spider web with four overarching criteria: relevance, consistency, practicality, and sustainability in order to help establish a balance between the curriculum concepts as it was suggested by Van den Akker et al. (2009) that it is not easy to balance out the spider web concepts. Hence, they cautioned that teachers should not prioritise some CSW concepts more than others as they are equally important. This suggests that if teachers disregard one concept during the teaching and learning process, the whole spider web will collapse, thus affecting the quality of teaching. It is for this reason that Berkvens et al. (2014) supplemented the CSW diagram with four criterions to guide teachers in teaching decision-making and reflecting upon those decisions.

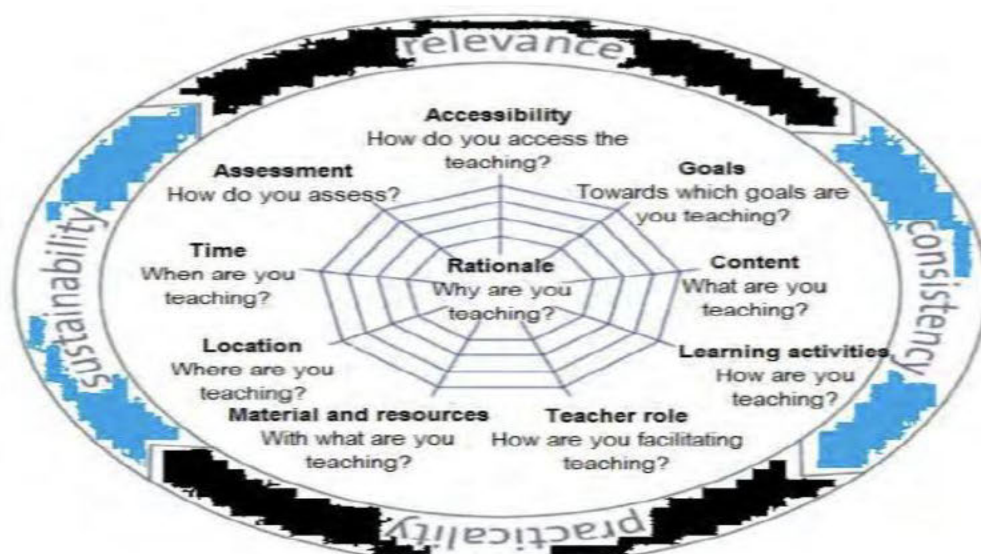

Figure 3.1: The Curricular Spider Web Framework adopted by Berkvens et al. (2014)

Furthermore, Van den Akker et al. (2009) maintain that the CSW is used to inform curriculum development and implementation towards quality education. This suggests that the CSW diagram is used by curriculum designers and developers to determine how they shape new curriculum reforms and by teachers for effective lesson planning. De Groot-Reuvekamp et al. (2014) and Khoza (2019) argue that at the school level, the CSW helps teachers see the interconnection between the curriculum aspects (such as resources, content, activities, etc) which are part of the CSW diagram. This implies that this framework provides teachers with clear direction on how they should teach and reflect upon their teaching. As such, using the CSW as the conceptual framework of this study helped ascertain teachers' understanding and their implementation of topography based on how they reflected on the concepts of this curriculum diagram. In other words, the usage of the CSW as a framework for this study was necessary because it allowed the researcher to generate data that addressed the research questions of the study.

3.2.1 Teaching rationale: why are they teaching topography?

Van den Akker et al. (2009) describe the teaching rationale as a question that addresses the visions, aims, or intentions of teaching a particular subject (why teachers teach geography). This implies that there are specific reasons that underpin the inclusion of a particular subject (geography, in this case) as part of the school curriculum. In support of this, Berkvens et al. (2014) postulate that the rationale of a subject goes as further as influencing the content of that subject. This suggests that topography serves a particular purpose in the geography subject. According to Berkvens et al. (2014), the teaching rationale is separated into three prepositions: personal rationale, societal or social rationale, and content rationale. A study conducted by Makumane and Khoza (2020) on teachers' reasonings (teaching rationale) sampled twenty-two teachers to find out how their reasoning/teaching rationale impacted curriculum attainment in learners. This study provided descriptions of the three prepositions of the teaching rationale.

According to Makumane and Ngcobo (2020), personal rationale can be defined as unique teaching strategies employed by the teacher to achieve the desired goals of the subject. This suggests that personal rationale promotes technical reflections as it is concerned with teacher's personal beliefs and feelings about teaching a particular subject. Makumane and Ngcobo (2020) describe content or professional rationale as the facts, beliefs, and theories of a specific discipline. This suggests that professional rationale promotes the use and application of professional knowledge during teaching and learning. Thus, professional rationale promotes practical reflection where teachers should consider the theories and assumptions that underpin the curriculum they ought to deliver. Finally, Makumane and Ngcobo (2020) describe the societal or social rationale as societal needs that influence the subject's inclusion in the school curriculum. Thus, societal rationale promotes critical reflection where teachers ought to consider how the teaching of their subject will affect the society. The study concluded by declaring that for teachers' to be able to successfully implement the curriculum, they should reflect in all three prepositions of the teaching rationale. This suggests that geography teachers' reflections on teaching topography should demonstrate personal, professional, and societal rationale. Should their reflections lack any of the rationales, it would signal they do not adequately understand the curriculum (topography) they are teaching.

Furthermore, Berkvens et al. (2014), as well as Makumane and Khoza (2020), seemingly concur that the three prepositions of teaching rationale all serve an important purpose in teachers' enactment of the intended curriculum and are, therefore, equally important. The effects of these prepositions on the implementation of the curriculum have been explored in various studies. For instance, the action research case study conducted by Khoza (2015b) on twenty-two postgraduate University students employed as educators in South African schools, implementing the CAPS curriculum. The study aimed to explore their reflections on their implementation of the CAPS curriculum in different learning areas. The study found that teachers were mostly influenced by the societal rationale in teaching their subjects, as their teaching philosophy involved socialising learners for active participation in the society. This suggests that teachers disregarded the personal and professional rationale. While Makumane and Khoza (2020) found the absence of the professional rationale to pose a great threat to curriculum implementation, Khoza (2015b) shows that the presence of it without the other supporting rationale elements is still detrimental to a successful curriculum delivery.

This signifies that all rationale elements need to be evident in one's teaching for the intended curriculum to be implemented effectively (Berkvens et al., 2014; Makumane & Khoza, 2020).

Seemingly, it is a challenge for teachers to reflect on all three elements of the teaching rationale. This is further evident in two additional studies that explored teachers' reflections using the curricular spider web diagram. These studies are Nzuza (2019), who conducted his study on EMS teachers' role in preparing learners for FET phase accounting and Mpungose (2015), whose study is centred on grade 12 teachers' reflections on teaching physical sciences in rural schools. Both these studies found teachers to possess limited rationales for teaching their respective subjects. Nzuza (2019) found most teachers to be driven by passion (personal rationale) in teaching EMS. On the contrary, those sampled in Mpungose (2015) were driven both by passion and the importance of physical science in people's lives (personal and societal rationale). There seems to be a growing trend for teachers who assume personal and/or societal rationale to dismiss the professional rationale (curriculum prescriptions). This is evident in Makumane and Khoza (2020); Mpungose (2015) and Nzuza (2019). This suggests that the professional rationale is mostly underplayed in curriculum delivery. Khoza (2015a) argues that the professional rationale requires teachers to deliver the curriculum as stipulated in the curriculum policy. This means that the professional rationale influences teachers to go by the books when teaching. In other words, disregarding the professional rationale equates to ignoring the curriculum directives. This suggests that teacher reflections that exhibit a lack of the professional rationale may signal that teachers are not implementing the curriculum accordingly. Instead, they lean more towards their personal feelings and societal needs when teaching. While the personal and societal rationales have their place in teaching (accounting for contextual circumstances), Durukan and Saglam-Arslan (2015) caution that teachers must not displace the professional rationale as this may cause misalignment between the intended and enacted curriculum. This signifies the importance of professional rationale while not discrediting that of personal and societal rationale. Thus, reflections of geography teachers who optimally reflect upon topography teaching must exhibit all three teaching rationales.

3.2.2 Accessibility: who are they teaching?

According to Van den Akker et al. (2009), accessibility is concerned with how teachers access teaching and who the recipients of their teaching are. Teachers teach learners at school in a specialised environment (Bernstein, 1975a). According to the South African Bill of Rights (1996), everyone has the right to education. As such, the government is obligated to build enough schools and provide enough teachers to ensure every learner has access to education, irrespective of their socio-economic status, ethnicity, and gender (Van den Akker et al., 2009). Thus, the availability and involvement of teachers are the keys to ensuring that learners receive education. Berkvens et al. (2014) maintain that teachers' access to teaching is usually influenced by three factors. These are physical factors (is the school reachable), financial factors (is the education affordable), and cultural factors (is the teaching programme socially acceptable). This suggests that geography teachers' reflections on teaching topography should demonstrate teachers' awareness of the influence these three factors have on accessibility.

As Berkvens et al. (2014) previously alluded, the physical factor involves all the physical resources that support teaching. These include schools, classrooms, and teaching resources, inter alia. Khoza (2015a) views teachers as part and parcel of physical resources, as schools cannot operate without them. Therefore, it is of paramount importance that schools are accessible to teachers so that teaching may occur efficiently. Motala et al. (2009), who explored physical access to education from two districts in two provinces of South Africa, declared that the South African government had built enough schools to support teaching and learning. However, two recent studies conducted on the same phenomenon (physical access) noted contradicting findings to the preceding claim. One of these studies is Du Plessis and Mestry (2019), which explored teachers' reasons for disinterest in teaching in rural schools. The other one is Muremela et al. (2021), who explored the challenges of retaining qualified teachers in rural areas. Both these studies note that teacher accessibility to schools is a major problem in rural areas that poses a great threat to the quality of education in the country. They found that rural schools are not easily accessible by teachers due to the lack of road accessibility and unreliable public transport. Dichaba and Ndandani (2013) argue that the inaccessibility of the school by teachers may sometimes discourage teachers from teaching learners. This suggests that effective accessibility to schools by teachers may be correlated to the level of development of the communities under which schools are situated. This suggests

that physical factors of accessibility promotes technical reflections where teachers consider how their accessibility to the school may influence their teaching of topography.

Moreover, Muremela et al. (2021) note that sometimes teachers must drive or walk long distances to reach the school. As such, they spend a lot of money on petrol or public transport to access the school (financial access). This causes exhaustion to teachers, making them feel less enthusiastic about teaching (Dichaba & Ndandani, 2013). This suggests that access to the school by teachers can positively or negatively influence how teachers teach learners. Muremela et al. (2021) argue that the inaccessibility of schools for teachers due to long distances, gravel roads, insufficient teaching resources and financial costs associated with these problems has led to teacher emigration in some schools, especially in rural areas. Teachers move to well-resourced and easily accessible schools closer to their homes or with reliable accommodations. This aggravates the declining population of qualified teachers in inaccessible schools (rural schools) and dilapidates education quality even further. This suggests that teachers teaching in easily accessible schools are more likely to teach topography effectively than those teaching in inaccessible schools, as they may be impeded by many factors that a pose threat to the way they teach.

Another study conducted by Poti et al. (2014), explored the measures the Department of Basic Education has implemented to alleviate financial impediments that threaten access by teachers in various schools, particularly rural schools. The study notes that teachers working in rural schools are given a rural allowance in order to attract and retain qualified teachers in these areas. However, not much has been done to address the challenges that impede their access to the schools, such as the poor state of roads, lack of resources, and electricity, inter alia. Evidently, this approach also fell short of enticing qualified teachers to remain and teach in disadvantaged schools. Hence, recent findings from Muremela et al. (2021) shows that emigration of qualified teachers in rural areas has increased in the last few years. It is important to note and acknowledge the strides the department has taken to bridge the gap of accessibility to schools by teachers. However, the department is silent on the requirements needed for one to access the teaching of geography. This has led to geography education being taught by unqualified teachers (Ahiaku & Mncube, 2018). This suggests that anyone may have access to the teaching topography. However, Van den Akker et al. (2009) contend

that teachers without necessary qualifications may not be able to adequately access the content knowledge of a subject and effectively make it accessible to learners as well. This suggests that the silence of the CAPS policy on who should teach geography (or topography) makes the subject more susceptible to poor implementation and inaccessibility to teachers and learners.

Another determinant of accessibility that influence education quality is school culture. The influence of culture in teaching and learning has been widely explored in the international and local literature (Craig, 2009; Guise, 2009; Peterson & Deal, 2009). These scholars argue that school cultures are unique and influential in shaping teachers' actions, thoughts, and feelings. This seems to imply that the culture of the school may shape geography teachers' reflections. Thus, the school culture determines how teachers reflect upon their teaching and come to understand their reflections. Conversely, teachers' reflections may illuminate the culture of the school. In South African schools, the influence of culture is most evident in multiracial schools, especially historically White schools (ex-model C schools). Mazibuko (2006) argues that Black learners who attend ex-model C schools are expected to assimilate into the culture of White learners as their cultures are deemed unimportant and inferior in comparison to White cultures. As a result, ex-model C schools have only transformed in terms of admission policies but little have been done to ensure learners of other races are accommodated and equally included in teaching and learning (Machaisa & Mulaudzi, 2019). However, Maluleke (2019) argues that the issue of Black learners not being equally represented in curriculum implementation is not limited to ex-model schools, but also happens in other multiracial schools. Maluleka argues that teachers in these schools fail to transform the intended curriculum to suit the needs of Black learners as they are not very informed of their culture. This suggests that the cultural factors promote critical reflection where teachers ought to consider whether or not their practices encourage social justice and equality regardless of differences of learners in the school. Hooijer and Fourie (2009) concur that it is important for teachers who teach in multiracial or multilingual schools to engage in critical reflections to assess the accommodativeness of their teaching approaches. This suggests that geography teachers in Chatsworth schools should reflect critically upon their teaching of topography to understand whether their teaching equally accommodates Black and Indian learners.

3.2.3 Aims and objectives: which goals are they teaching topography towards?

The teaching goals (aims, objectives, and outcomes) are described by Noddings (2007, p. 7) as "hierarchically ordered educational purposes". This suggests that aims, objectives, and outcomes are interconnected and sequentially inform or guide curriculum development and implementation. Van den Akker et al. (2009) concur that aims and objectives communicate the outcomes of the curriculum, which Noddings (2007, p. 7) refers to as "purposes" and further argues that aims and objectives are subject based. This suggests that aims and objectives highlight the importance of a subject and dictate how that subject is taught. On the other hand, outcomes are defined by Khoza (2015b) as measurable behaviours that learners should exhibit at the end of a lesson or course. Outcomes are derived from the aims and objectives of the curriculum (Berkvens et al., 2014; Noddings, 2007; Van den Akker et al., 2009), while the objectives and outcomes are translated from the aims (Kennedy, 2006; Khoza, 2015b). Donnelly and Fitzmaurice (2005) argue that objectives are specific statements denoting teachers' intentions for teaching, while aims are general statements denoting teachers' intentions for teaching. In contrast, these authors define outcomes as specific statements that denote the end goal of teaching or expected learner skills.

Furthermore, owing to the importance of aims and objectives in guiding teachers towards quality teaching, Noddings (2007) and Van den Akker et al. (2009) argue that it is important for geography teachers to reflect on the aims and objectives to ensure the goals of education are met. This suggests that reflections may help geography teachers gauge if they are driving teaching towards the envisaged outcomes. To achieve this, geography teachers may use teaching activities informed by the aims and objectives of geography when teaching topography. Kennedy (2006) and Khoza (2015b) distinguished between aims and objectives. They argue that aims are long-term general statements indicating teachers' intentions, while objectives are short-term specific statements also indicating teachers' intentions. This suggests that aims promote technical reflections where geography teachers ought to reflect on the reasons why it is necessary to topography while objectives promote practical reflection where geography teachers ought to consider why certain topics within topography content must be taught. Thus, in technical and practical reflections, geography teachers should use

teaching outcomes as the yardsticks to measure the effectiveness of their teaching, promoting critical reflection.

The study conducted by Khoza (2015b) explored teachers' understanding of curriculum goals (aims, objectives, outcomes) in their respective teaching subjects. This interpretive study reported on two out of twenty university postgraduate students selected purposely from a South African University. The postgraduate students were employed as schoolteachers in South African schools. The study notes that the two teachers seemed to have flawed conceptualisations of the aims and objectives of the subjects they were teaching. Nonetheless, they were able to apply them in their teaching as prescribed by the CAPS document. This suggests that these teachers were pushed by the professional rationale to incorporate the curriculum goals in their teaching but did not understand the rationale that informs the aims and objectives of their teaching subjects. However, through participation in Khoza's study, they gradually developed the ability to reflect critically on the aims and objectives. This consequently improved their practice. Thus, it is not sufficient to be aware of the teaching aims, objectives, and outcomes, but one needs to critically reflect on them to examine if their practices are aligned with curriculum goals (Khoza, 2015b). Hence, the study conducted by Khoza (2015b) argued that teachers need to reflect on their teaching to understand if they are implementing the curriculum accordingly. Thus, critically reflecting on the curriculum aims, objectives, and outcomes would help geography teachers learn from their past and present actions to improve future actions.

Furthermore, the importance of understanding the aims, objectives and outcomes when implementing a curriculum is succinctly expressed by Rakhmonberdievich (2021), who postulates that educational goals (aims, objectives and outcomes) help teachers scope out whether or not their curriculum implementation is successful and effective. Thus, teachers may use educational goals to evaluate their practices. This suggests that for geography teachers to reflect on their curriculum implementation of topography adequately, they need to understand what the intended curriculum seeks to achieve with the inclusion of topography as one of the aspects of the mapwork component. Rakhmonberdievich (2021) further declares that knowing educational goals also helps teachers employ appropriate teaching methods and resources. Likewise, Noddings (2007) declared teachers should think of the curriculum goals

when deciding what to teach and how to teach it. Thus, if these curricular decisions are not made consciously, a hazardous misalignment between the intended and implemented curriculum could occur (Sethole, 2004). This suggests that teachers must continuously reflect on their teaching to ensure sound decision-making during instruction.

In the CAPS document for Geography, the aims of offering the geography subject are expressed as specific aims and are aligned with the general goals of the CAPS policy. This means that the teaching of all CAPS subjects collectively brings about the general goals of the CAPS curriculum. According to Department of Basic Education (2011, p. 8), the specific aims of the geography CAPS curriculum include "explaining and interpreting both physical and human geographical processes; describing and explaining the dynamic interrelationship between the physical and human worlds; developing knowledge about where places are, and the nature of a range of different places at different scales; practising essential transferable skills – literacy, numeracy, oracy and graphicacy; promoting the use of new technologies, such as Information Communication Technology (ICT) and Geographical Information Systems (GIS); developing a commitment towards sustainable development; creating awareness and sensitivity to inequality in the world; ostering empathy, tolerance and fairness; and making and justifying informed decisions and judgements about social and environmental issues". These aims are specific to the FET phase and encompasses all the knowledge strands of the geography curriculum in the FET phase. However, the objectives, which Khoza (2015a) define as measurable, have been omitted from the CAPS policy. Thus, there is not adequate guidance on how geography teachers should teach topography or what parameters they must use to assess their teaching of topography. Instead, it is left to teachers to decide the teaching objectives. Khoza (2015b) found that some teachers cannot understand and incorporate teaching objectives into their practice.

Based on the studies reviewed above, there seems to be a consensus among scholars that the aims, objectives and outcomes play a major role in curriculum implementation. Both Khoza (2015b) and Rakhmonberdievich (2021) concur that a clear understanding of the educational goals (aims, objectives and outcomes) brings out curriculum alignment. However, it is worth noting that participants sampled by (Khoza, 2015b) initially did not understand the educational goals of the curriculum they were implementing. Thus, a large sample study is

needed to gauge teachers' knowledge of aims, objectives and outcomes, as the lack of understanding them has been found to sabotage curriculum implementation.

3.2.4 Content: what are they teaching?

Van den Akker et al. (2009) views curriculum content as one of the core components of a curriculum, as it serves as the lever through which the aims, objectives and outcomes of a curriculum are realised. This means that curriculum content is selected based on what the developers aim to achieve with the curriculum. This is well articulated by Schneiderhan et al. (2019), who declare that curriculum content is determined by working backwards from the specific educational goals. Thus, the aims, objectives and outcomes of geography education determine what content is to be taught by teachers. On the same line of thought, Berkvens et al. (2014, p. 6) contend that "a well-considered vision and articulated educational aims, objectives and outcomes can guide the decision on the content of subjects, which need to consider the subject knowledge that is truly essential to the core of the subject while also taking contemporary developments in the subject area into account". This clearly illuminates that the content of geography is closely tied to its subject aims and objectives. Therefore, teachers must possess deep subject matter (content) of the subject they teach (Loewenberg Ball et al., 2008; Shulman, 1987; Shulman, 1986). Rich subject knowledge enables teachers to make sound decisions on how they will present knowledge to learners and ultimately assess it (Shulman, 1987; Shulman, 1986). This seems to imply that without concrete knowledge of topography, geography teachers may not be able to teach topographical maps effectively.

Concerning the above, many geography teachers have been found to lack topography content knowledge (Ahiaku & Mncube, 2018; Ahiaku et al., 2019). This causes defects in the way in which teachers teach topography, causing a mismatch between the subject content and the educational goals (aims and objectives). Berkvens et al. (2014); Parker and Lo (2016); Van den Akker et al. (2009) argue that it is important for teachers to understand the premises through which subject content is selected. This suggests that teachers should engage in reflections to understand the visions that influence the subject matter. Further, these scholars outline that subject content is selected on the basis that; it will produce knowledgeable and skilled individuals, encourage learners' personal development, and channel learners to

becoming participating individuals in society. Thus, these aims are what is at stake when teachers demonstrate shallow content knowledge of the subject they teach. Therefore, reflections may help geography teachers evaluate the amount of subject matter they possess and how it may affect their teaching of topography.

According to Carl (2009), curriculum content should be fair, well arranged and well-structured. Several studies have explored the nature of the content element of the CAPS curriculum. For instance, the study conducted by Wilmot and Irwin (2015). The study explored the perceptions of fifteen South African school teachers on the geography curriculum of primary schools. The participants (fifteen teachers) were purposively sampled from eight schools in the Western Cape province. Semi-structured interviews were utilised to generate data for the study. The study found that while geography topics studied at each grade seem to be coherently interlinked, there seems to be curriculum discontinuity from one grade to another. Thus, the geography curriculum is seemingly fragmented across grades or levels. A similar argument was echoed by Ontong and le Grange (2020), who argued that the discontinuity and lack of progression of the South African geography curriculum are alarming. To substantiate their assertion, these scholars argued that in grades 10 and 12, learners are expected to learn the same content, which includes explaining the GIS concepts, remote sensing, how remote sensing works, and the reasons for GIS development. GIS is one of the mapwork components in the CAPS curriculum. This suggests that the topography curriculum is weakly structured.

According to the Department of Basic Education (2011), the geography curriculum has four knowledge strands that must be taught at the FET phase. These are climatology, geomorphology, settlement geography, and economic geography. Thus, these four knowledge strands collectively form content knowledge of the geography subject (Shulman, 1987). The document advises for these knowledge strands to be taught in chronological order and for teachers to incorporate topography in all four strands. Thus, the topics to be covered in topography teaching are spread across all four knowledge strands that constitute content knowledge of the geography subject. Furthermore, the CAPS curriculum policy documents advise that geography teachers should conduct fieldwork when teaching topography to help learners visualise how mapwork studies interact with the theoretical part of geography

(Department of Basic Education, 2011). This suggests that at the technical level of reflection, geography teachers should be able to deduce which topics in each knowledge strand relates to topography. Thereafter, they should be able to determine fieldwork activities appropriate for teaching those topics (practical reflections) and draw connections for learners between geography theories and their application in real-life situations (critical reflections).

3.2.5 Teaching activities: how are they teaching?

Van den Akker et al. (2009) define teaching activities as any planned learning experiences that teachers use to present the subject content or knowledge to learners. Teaching activities are also used by teachers to foster certain competencies in learners (Chou, 2011). This seems to imply that teaching activities enforce the expected behaviours of learners (outcomes). According to the Department of Basic Education (2011), teaching activities can be conducted in a form of informal, formal and continuous teaching activities. Notably, teaching activities are used to develop certain skills in learners and simultaneously track their progress towards their expected competencies. This suggests that teaching activities precede and form the basis of all forms of assessments. Therefore, it is necessary that geography teachers reflect on the activities they use to teach topography. Perhaps more so since Ramsaroop (2018) reveals that teaching activities strongly influence how learners perceive and receive knowledge. This suggests that engaging in reflection may help geography teachers evaluate the effectiveness of their teaching activities in teaching topography.

In addition to the above, Alleman and Brophy (1999) reiterate the assertion by Department of Basic Education (2011) that teaching activities inform assessment by declaring that activities provide opportunities for teachers to monitor their learners' progress. The scholar argues that activities such as essays, laboratory tasks, projects, portfolios, and other assessments can be used by teachers as informal and continuous teaching activities to prepare learners for formal activities. As such, it is mandatory that learner performance in teaching activities is scrutinised for feedback and remedial support provision purposes. This is in line with the CAPS prescriptions in the assessment component. The policy prescribes that teachers must conduct informal activities to continually collect information on learners' progress and use that information to improve their teaching. This suggests that informal teaching activities

promote technical reflection where teachers evaluate the effectiveness of their teaching strategies and activities. The CAPS policy also encourages teachers to assign continuous teaching activities such as projected-based assignments to foster individual learning (Department of Basic Education, 2011). This suggests that continuous teaching activities promotes practical reflection where teachers assess learners' acquisition of skills over an extended period.

According to Berkvens et al. (2014), teachers should utilise teaching activities (informal, formal and continuous) consistent with the curriculum to ensure successful curriculum implementation. This suggests that whatever teaching activities geography teachers use when teaching topography must align with the educational goals. Correspondingly, this implies that the educational goals should inform teachers' reflections on teaching activities. However, this has been reported to be a challenge for many South African teachers. This is illuminated in the qualitative case study Taole (2013) conducted in the Brits district of the Northwest province to explore teachers' conceptions of the curriculum review within the context of educational change in South Africa. Ten intermediate and senior phase teachers were purposefully sampled in the study. The researcher views teachers as the agents of change as they are the ones who implement curricular changes through the teaching activities they administer in the classroom. However, it is revealed in the study that the curriculum changes have been misconstrued by teachers and inaccurately implemented through inappropriate teaching activities that are not in line with the curriculum changes. This seems to imply that teachers did not reflect upon their teaching activities to evaluate their suitability in achieving educational goals. In the study, teachers' use of inappropriate teaching activities is attributed to insufficient school resources and teacher training. Thus, intervention from the department of education in this regard is required. Congruently, Du Plessis and Marais (2015), who explored teachers' reflections on their transition from the NCS to the CAPS curriculum reform, concur that a considerable number of teachers are unable to adjust their teaching styles and activities to suit the standard of the CAPS curriculum policy. Thus, reflections may afford geography teachers teaching topography an opportunity to assess their own teaching activities.

Furthermore, as suggested by Taole (2013), it is worth noting that teaching resources may influence how teaching activities are carried out in the classroom. However, the case study conducted by Khoza (2013a) presents a twist to this argument. While notwithstanding the importance of resources in teaching activities, the study notes that the critical aspect in planning and designing teaching activities is the ideological ware resource. Ideological ware is defined by Khoza (2013a) as ideas or visions in terms of how and why certain teaching resources will be incorporated in teaching. Thus, using a teaching resource in executing a teaching activity may not be as effective if the resource is not consciously incorporated according to the objectives of the teaching activity. This suggests that teachers' reflections in deciding which teaching resources will drive their teaching activities must be influenced by an ideological ware. For this reason, Svinicki and Dixon (1987) argue that teaching activities must be carefully planned and executed to ensure active learning. Arthurs and Kreager (2017) provide two ways in which teaching activities can be used in the classroom. They argue that teachers can assign activities at the beginning of a lesson to encourage the construction of knowledge, promoting active learning or towards the end of a lesson to assess learner progress in grasping the concept being learned in the classroom. Thus, teaching activities may also help teachers reflect on the effectiveness of the lesson.

According to the CAPS curriculum policy, geography teachers should use fieldwork based (informal) and project-based (continuous) activities when teaching topography (Department of Basic Education, 2011). This suggests that teachers should not keep their topography lessons confined to the classroom environment. However, for effective teaching of topography, they ought to take learners in the field to help them visualise how topographic topics apply in real-life context and thereafter assign project-based activities to foster ongoing learning. Thus, informal (fieldwork-based) and continuous (project-based) activities precede formal activities. This suggests that in critical reflections, geography teachers should be able to outline how fieldwork-based activities (informal) and project-based activities (continuous) improve learners' performance in formal activities.

3.2.6 Educator role: how are they facilitating their teaching?

The teacher role is viewed by Kaur (2019) as one of the key elements in curriculum implementation. He argues that teachers' understanding of their roles influences how the

curriculum policy is enacted. Thus, a teacher is a key player in realising the aims of a curriculum. Echoing Kaur's argument, Geier (2021) asserts that the extent to which the teacher role is significant in education extends as far as influencing learner performance. Therefore, teachers need to assume appropriate roles when teaching learners. Scholars such as (Hoadley & Jansen, 2013; Khoza, 2013b, 2015b) present three types of teacher roles. These are the instructor, facilitator, and assessor roles. Each of these roles adopt a particular approach to teaching. Instructors design teacher-centred lessons while facilitators implement learner-centred lessons. On the contrary, assessors design content-centred lessons. Teachers may assume either of these roles when teaching. The reflections from geography teachers on teaching topography may help ascertain how they perceive their roles in teaching topography.

Furthermore, Hoadley and Jansen (2013); Khoza (2013b); Khoza (2015b) present a set of characteristics that distinguish between instructor, facilitator, and assessor roles. They argue that instructors design lessons according to the aims and objectives of the curriculum. As a result, they use a teacher-centred approach. This suggests that the instructor role promotes technical level of reflection as teachers are more concerned with ensuring that the intended curriculum is delivered as outlined in the curriculum policy documents. On the other hand, facilitators design lessons informed by the teaching objectives. Consequently, their lessons tend to be learner centred. This suggests that the facilitator role promotes practical reflection as it encourages teachers to consider the practicality of their teaching strategies.

In addition to the two teacher roles discussed above, Hoadley and Jansen (2013) and Khoza (2015b) presented the third teacher role – an assessor. They argue that teachers who assume the role of an assessor when teaching design and implement lessons that are driven by the content. Thus, such teachers rely on what the curriculum policy prescribes to ensure the implemented curriculum is aligned with the intended curriculum. This suggests that reflections of teachers who assume the role of an assessor would be guided by the specifications of the curriculum. As such, similarly to instructors, these teachers employ a teacher-centred approach when teaching. While these teachers' roles and associated teaching approaches offer varying merits and demerits to curriculum implementation, extensive literature advocates for a learner-centred approach and the teacher role of a facilitator (Al-Zu'be, 2013; Du Plessis, 2020; Rege Colet, 2017). However, Khoza (2013b) and Khoza

(2015b) suggest that for quality teaching to occur, teachers need to move beyond the dichotomy of teacher-centred or learner-centred by playing all three roles concurrently when teaching. This suggests that teachers who incorporate more than one teacher role in their curriculum delivering can reflect critically upon their teaching. As such, they are able to determine when to lean towards instructor, facilitator or assessor role in their teaching. Thus, a teacher whose reflections are not informed by all three roles is not implementing the curriculum correctly. Hoadley and Jansen (2013) argue that teachers can achieve the infusion of these three roles in one lesson by merging Tyler (1959) product approach and Freire (1985) political approach in understanding and reflecting on their roles as curriculum implementers.

In addition to the above, Hoadley and Jansen (2013) suggest that how teachers perceive their roles as curriculum implementers and the teaching approaches they use when teaching is closely intertwined with the curriculum framework that informs the curriculum policy. These scholars argue that teachers who implement a curriculum informed by the competence approach ought to employ a learner-centred approach and facilitator role when teaching. In contrast, teachers who implement a performance curriculum may employ a teacher-centred approach and the associated teacher roles. As such, these scholars outline how teacher roles are embedded in the two different curriculum approaches. They argue that the teacher's role in the competence curriculum is covert, while it is overt in the performance curriculum. Thus, teacher expectations and boundaries are clearly demarcated and communicated in the performance curriculum, while they are blurry in the competence curriculum. To put it into perspective, these scholars argue that within a competence curriculum, teachers should facilitate or guide learners towards making connections between their everyday knowledge and formal knowledge rather than spoon-feeding learners all the information – as it customarily happens within the performance curriculum. Gardner (1991) contends that for teachers to successfully implement a curriculum policy, they need to understand the policy itself and the curriculum approach that underpins it as it determines their teacher role. They further argue that this is more crucial for teachers implementing a competence-based curriculum as it places extreme demands on teachers, some of which are not so easily identifiable.

Several studies have explored how teachers understand their roles. However, these studies do not mention which curriculum approach teachers were implementing. One of these studies is the study conducted by Ayustina et al. (2018) in Indonesia to understand the roles played by teachers when implementing the Curriculum 2013. It is said that the Curriculum 2013 of Indonesia is concerned with “learning how to learn” (Ministry of Education and Culture in Indonesia, 2014). Thus, learners are at the centre of learning and should be channelled towards learning how to think rather than what to think. This, therefore, positions this curriculum as a competence curriculum. The study notes that teachers played various roles during teaching. They were motivators, facilitators, controllers, organisers, and assessors. These roles were found to influence teaching and learning in the classroom positively.

Moreover, Lum et al. (2019) conducted another study on lecturers’ and students' understanding of a good teacher through the lens of roles that define a good teacher. Four hundred and seventy students and one hundred and one lecturers were sampled in this study. The participants were selected using the twelve teacher roles suggested by (Crosby, 2000). The study was conducted at a medical university in Malaysia. Questionnaires were used to generate data where lecturers and students were asked to three most important roles of a good teacher in the roles offered by Crosby. The study used statistical analysis to analyse participants’ responses. Upon analysing responses, it was found that most lecturers and students selected the role of a teacher as an information provider, followed by the model role. The roles of instructor, assessor, planner and resource developer were least mentioned by both lecturers and students. However, it is not mentioned in the study what kind of curriculum was used in this particular university as it has been offered by Hoadley and Jansen (2013) and others that the teacher role is determined by the nature of the curriculum they are implementing. Nonetheless, the researcher maintained that the rationale behind the information provider role in Malaysia is likely to be culturally based as it is common in Asian society for teachers to be perceived as the repositories of knowledge and should demonstrate their knowledge to assert their competence in their profession. Thus, what teachers believe to be their role in implementing the curriculum is not only entrenched in the nature of the curriculum but may also be influenced by the beliefs they hold as well as those generally accepted in their societies.

Evidently, the intended curriculum for the geography subject (CAPS policy) is quite prescriptive in terms of the content that teachers ought to cover in each. However, the CAPS policy is silent on the teaching roles and approaches that geography teachers should employ when teaching geography or topographical maps. This suggests that teachers may assume whichever roles they see fit when teaching and reflecting on their teaching and may also employ whichever teaching approach they are comfortable with. This may result in a distorted execution of the intended curriculum, affecting the quality of topography teaching in schools.

3.2.7 Teaching resources: what are they teaching with?

Van den Akker et al. (2009) position teaching resources as an important part of teaching and learning as they enable teachers to present data or information in more effective ways. Succinctly, Khoza (2013a) define teaching resources as anything curriculum implementers use to communicate the curriculum to those they teach. Additionally, Khoza (2013a) identifies three types of teaching resources, namely hardware, software, and ideological ware. Khoza further distinguishes between these types of resources. He defines a hardware resource as any tool or machine teachers use to present data to learners, such as computers. On the contrary, he describes a software resource as any program teachers use to display data in a hardware resource. Thus, these two types of resources cannot be divorced; software resources cannot exist without hardware resources, while hardware resources may not be as effective without the software through which they operate. Further to this, Khoza distinguishes ideological ware as non-physical resources that influence how teachers choose to teach. These includes teaching ideologies and curriculum approaches, among other things. Amongst the three types of resources, which are somewhat closely related, Khoza views ideological ware as the important teaching resource that drives the teaching and learning process. On the same line of thought, Khoza (2015b) maintain that ideological ware is concerned with visions of why a teacher may use a certain teaching resource (whether hardware or software) in a particular way. This seems to suggest that the ideological ware dictates the hardware and software resources that teachers may use in their teaching.

Furthermore, Van den Akker et al. (2009) view teaching resources as the indispensable component of curriculum implantation as it may be virtually impossible for teachers to enact

the intended curriculum without the teaching aids. They argue that the content that is taught in schools is disseminated through textbooks, departmental documents, etc., which form part of the hardware resources. Even so, teachers rely on other hardware and software resources when presenting the subject content before learners, such as computers, chalks, and boards, among other things. For this reason, these scholars view teaching resources as the vehicle through which the curriculum is delivered. Expanding on the effects of teaching resources on the implementation of the intended curriculum, Nakpodia (2011) asserted that teachers' performance in implementing the curriculum depends on school principals to ensure adequate availability of the required resources and supervision to ensure the resources are utilised to their maximum potential. This suggests that principals must provide teaching materials (such as textbooks and maps) for geography teachers, so they are not constrained in teaching the geography subject, particularly topographical maps – as of concern to this study. Nakpodia (2011) further outlined the hardware and software resources principals should provide for teachers, such as textbooks, charts, and other resources that teachers and learners can use during teaching and learning and software resources, such as the internet, where learners can access educational materials. Thus, geography teachers should reflect on whether they are able to utilise teaching resources to their maximum potential to ensure effective teaching and learning.

Additionally, Van den Akker et al. (2009) declare that teachers are tasked with providing resources at the micro level, such as lesson materials and other resources, as they have the power to decide what happens in their classrooms and how the curriculum is implemented. This suggests that teachers or educators are to make their collections in terms of teaching aids they may need or work together with the school principals if a required teaching resource may be inaccessible. While teachers are responsible for selecting appropriate teaching resources or aids for their lessons, Fomunyam (2014) and Khoza (2013a) seemingly regard teachers as part and parcel of teaching resources. The study by Fomunyam (2014) openly declared teachers as teaching resources since they are the ones who communicate the curriculum.

Khoza (2018) conducted a study exclusively aimed at understanding teachers’ reflections on their experiences and practices of using digital resources to teach grade 12 mathematics

within the CAPS curriculum. The study used one-on-one semi-structured interviews, reflective activities, and journals to generate data from six teachers sampled purposively and conveniently. The study found the successful implementation of the CAPS document to be dependent on the ideological ware resources and critical reflections. Thus, a teacher who can reflect critically on their teaching is more likely to select teaching resources consciously. This implies that teachers must not choose teaching resources on the basis of availability. However, they must be driven by the vision of using those resources and know how to use them to serve the teaching objectives (ideological ware). As such, this study maintains that critically reflective teachers are more likely to overcome challenges that may arise during teaching and learning. This suggests that geography teachers should use ideological ware when selecting teaching resources for teaching topographical maps and ultimately reflect critically on the use of those resources in teaching. This implies that critical reflections in selecting teaching resources are influenced by the ideological ware resources while technical and practical reflections are influenced by hardware and software resources, respectively.

In the CAPS policy document, the Department of Basic Education (2011) outlines the teaching aids that geography teachers should utilise when teaching topography. These include resources such as topographical maps, atlases, orthophoto maps, aerial photographs, GIS images, basic weather instruments, synoptic weather maps, weather measuring instruments, and DVDs. The document further provides internet links where educators and learners can find educational resources online. This suggests that the CAPS document for geography relies on using hardware and software resources for curriculum implementation. Though the document prescribes several teaching aids, the rationale or vision behind using these resources seems to have been neglected in the document. This way, the CAPS document lacks the ideological ware resources. It is worth noting that the CAPS document also does not specify how teachers should incorporate these resources in teaching and learning or for which mapwork topics they are to utilise these resources. This is likely to emanate from the lack of ideological ware, which dictates what resources are used and how they are utilised.

Berkvens et al. (2014) have explored the use of teaching aids or resources in teaching and learning. These scholars concur that resources are the carriers of the curriculum. Nonetheless, they contend that it is important for teachers to be able to use teaching resources effectively.

Thus, the availability of teaching resources would prove futile if teachers are unable to incorporate those resources practically. However, the aspect of how the prescribed teaching materials are to be used during curriculum implementation was left out in the CAPS document, suggesting negligence from curriculum developers. Interestingly, some studies have also declared that many South African schools are constrained by the shortage of teaching aids in implementing the intended curriculum (Ahiaku et al., 2019; Manik, 2022). This further illuminates the departmental negligence as they prescribe teaching resources that may hardly be available in schools, negatively affecting the way the curriculum is implemented and learner performance.

3.2.8 Location and time: where and when are they teaching?

Van den Akker et al. (2009) present location and time as separate concepts in their curricular spider-web concepts framework. However, the qualitative case study conducted by Khoza (2013b) on six facilitators who were teaching Publishing Research at a South African University seems to suggest otherwise. This study revealed that teaching and learning occurred in a specified environment (lecture rooms) at a particular time and communicated to students via the timetable. Thus, according to the study by Khoza (2013b), geography teachers ought to teach topography in a designated teaching environment (classroom) and during an allocated time. Thus, the two elements (time and location) are intertwined. Khoza (2013b) understanding of time and location for teaching and learning is in line with that of Bernstein (1975b), who argues that within the performance curriculum approach, teaching is confined in a specified space (a classroom or laboratory) that will suit the nature of the subject being taught. Thus, teachers' reflections should concern whether the teaching environment is conducive. Hence, Coetzee (2009) declares that teachers should ensure that the classrooms used for teaching are conducive and have all the necessary instructional resources. Coetzee goes further and declares that teachers also need to make sure that the furniture in the classroom is organised in a way that will propagate effective teaching and learning. This suggests that geography teachers need to be aware of the appropriate teaching resources for topographical maps and further reflect on whether their classrooms are organised in a way that will support effective teaching.

Furthermore, scholars such as Chen et al. (2014); Hung (2015); Wang and Qi (2018) contend that teaching is not confined to a classroom or laboratory setting only but can also occur in any environment outside the classroom context. These scholars maintain that sometimes teachers can teach formal knowledge using homework or send video clips to learners which they can engage with before the stipulated learning time. They refer to this kind of teaching as flipped teaching as it opposes the traditional way of teaching. Canale and Swain (1980) associate flipped teaching with a competence-based curriculum on the merits that the competence approach aims to nurture learners' innate skills, necessitating in-class and out-of-class time to gain competence. Canale and Swain's argument suggests that developing learners' skills requires continuous engagement between teachers and learners. Hence, the study by Kerski (2003) focusing on GIS teaching identified the lack of time as one of the most troubling hindrances in teaching mapwork effectively. Thus, reflecting on location and time may give geography teachers insights on how these two elements may affect how they implement the curriculum.

With respect to the above, the way time and location are to be treated within a particular curriculum is dependent on the approach or framework (competence or performance) that underpins that particular curriculum. Hence, time and location are intertwined within the performance curriculum, as teaching is customarily confined to a defined environment. However, within the competence approach curriculum, there may be boundaries between the two elements (time and location) as teaching is not only restricted according to time and location but may occur anywhere. Thus, teachers' reflections on time and location should be guided by the nature of the curricular approach that underpins the intended curriculum.

According to the CAPS curriculum policy, geography teachers should spend a total of twenty-four hours in a year teaching topography (Department of Basic Education, 2011). This total amount of time is spread across all four knowledge strands of geography under which topography is found. This suggests that under each knowledge strand, teachers should reflect on how many hours of teaching time they will designate to topography teaching. This will signal technical reflection. Since the CAPS curriculum is a performance-based curriculum, it prescribes that majority of teaching happens within the classroom based environment (Khoza, 2015b). This suggests that geography teachers should keep topography teaching confined

within the specific teaching spaces (classrooms) to ensure the teaching time designated to topography is used efficiently. This suggests that geography teachers' ability to justify their preferred teaching environment for teaching topography would signal practical level of reflection. The CAPS policy also recommends several internet websites that may be useful to topography teaching (Department of Basic Education, 2011). This suggests that the CAPS curriculum developers understood that learning may occur at any time in any space despite the curriculum being performance-based in nature. This suggests that geography teachers who assign learning activities that prompt learners to make use of the internet are able to reflect critically upon their teaching.

3.2.9 Assessment: how do they assess their teaching?

According to Van den Akker et al. (2009), assessment is one of the most important parts of education as it outlines whether teachers can meet the curriculum aims and objectives. Thus, it forms the basis for evaluating the success of curriculum implementation. As such, different scholars have theorised about assessment, therefore leading to different conceptualities of this phenomenon. However, there seems to be a consensus among many scholars that assessment refers to techniques used by teachers to gather and analyse information about learners' level of attaining or achieving the learning outcomes of a curriculum (Darling-Hammond, 2006; Quansah, 2018; Taras, 2009), among others. Thus, assessment is concerned with teachers gauging their efficacy in implementing the curriculum and identifying their shortcomings and areas of concerns for learners. Thus, the assessment may help geography teachers reflect on the effectiveness of their teaching methods by scoping the gap between learners' attainted competencies and the expected competencies (learning outcomes).

Expounding on assessment, Van den Akker et al. (2009); Taras (2009); Yambi (2018), maintain that there are different approaches used by teachers to assess learners. These are formative and summative assessments. Yambi distinguishes between the two approaches to assessment by asserting that the main difference in these approaches lies in how teachers and other stakeholders use the assessment data (learner progress information). To illuminate this distinction, he offers definitions of the two approaches. Yambi defines formative assessment as any form of assessment used by teachers to examine the learning process and give feedback to learners on their progress to improve their future performance. Similarly,

McAlpine (2002) declares that teachers use formative assessment data (learner progress) to identify areas of remedial support. Thus, geography teachers may use formative assessment to reflect on the teaching outcomes they have managed to reach and devise ways in which they are going to achieve the outcomes they might have missed. For this reason, Marshall and William (2006) define formative assessment as "assessment for learning" and argue that this form of assessment is teacher-centred or serves teacher needs. McAlpine (2002), on the other hand, refers to it as an informal assessment as its results are used to inform teaching rather than passing or failing learners. Torres (2019) views teacher oral feedback on learners' tasks such as classwork, homework or any other tasks completed by learners as examples of formative assessment. This suggests that formative assessment promotes technical reflection as it may prompt teachers to reflect upon their teaching strategies against the desired teaching outcomes.

Furthermore, Yambi (2018) defines summative assessment as a form of assessment used mainly to promote learners to the next grade or retain them in the same grade. As such, Yambi argues that summative assessments are customarily administered at the end of the learning course. They are used to establish whether learners have attained the learning outcomes – determined by the aims and objectives of the educational course. Thus, summative assessment measures learners' overall performance in the learning course. On the same line of thought, Darling-Hammond (2006) opines that the purpose of summative assessment is to communicate or illuminate learners' abilities to teachers and other stakeholders to they can decide the fate of learners in terms of promotion and retention. While summative is important in illuminating the effectiveness of curriculum implementation, it does little in propagating learner support and effective teaching and learning. Hence, Marshall and William (2006) argue that summative assessment is subject-centred as it focuses mainly on curricular aims and objectives. These scholars further provide "assessment of learning" as a synonym for summative assessment, while McAlpine suggested formal assessment. Yambi (2018) offers examinations, tests, projects, and essay writing as examples of summative assessments.

In addition to the two assessment approaches suggested by Van den Akker et al. (2009) and Marshall and William (2006), as well as McAlpine (2002), present a third assessment

approach. They refer to this approach as continuous assessment. They argue that continuous assessment is not time bound but occurs throughout the learning experience. McAlpine (2002) asserts that teachers use continuous assessment to monitor learners' learning progress and outline what needs to be done to ensure successful teaching and learning. Thus, continuous assessment can be viewed as an ongoing assessment used by teachers to examine learners' development in attaining the expected competencies. For this reason, the distinctions between continuous and formative assessment are blurry. Makumane and Ngcobo (2020, p. 3) concur that, continuous assessment is "somewhat married to formative assessment". Makumane and Ngcobo further opine that this might confuse teachers as they may view continuous assessment (CASS) as a "teacher-centred form of assessment". Based on the description of CASS offered in this passage, it can be argued that if adequately understood, CASS may help geography teachers reflect on learners' shortcomings in topographical maps and consequently devise ways to conjure learners' excellence in topographical maps, thereby improving teaching and learning.

According to the geography CAPS policy, geography teachers must assess learners using formative, continuous, and summative assessments in the FET phase. The policy seemingly recognises the importance of assessment as it provides guidelines through which teachers should conduct these assessments. Teachers are encouraged to implement informal or formative assessments daily through observations, discussions, feedback during practical demonstrations. The policy further stipulates that geography teachers should allow peer assessment as a form of formative assessment in their classrooms. Regarding formal or summative assessment, the policy outlines that teachers should conduct and record these assessments for grading purposes. In each grade, geography teachers are required to conduct three assessment tasks, two class tests, a mid-year examination, and a final examination. The continuous assessment (CASS) contributes 25% towards the final examination mark while formative assessment contributes nothing. The 25% CASS comes from the six formal assessments conducted internally during the school. The remaining 75% comes from the year-end examination or summative assessment. Thus, learners' promotion to the next grade is dependent upon continuous and summative assessment.

3.2.10 Conclusion

This chapter has defined the conceptual framework employed to guide this inquiry. It has also justified the use of this particular conceptual framework in this study and provided a detailed description of all concepts that constitute this spider web. Further, this chapter contextualised the spider web with supporting literature. The next chapter will discuss the research design and methodology used to generate relevant data to address the research questions of this study.

CHAPTER FOUR

Research Design and Methodology

4.1 Introduction

The preceding chapter discussed the conceptual framework and conceptualised the existing literature into the conceptual framework of this study (curricular spider web). This chapter provides a detailed explanation of the methods and strategies used by the researcher to generate data on geography teachers' reflections (the research phenomenon of this study). It does this by discussing the research paradigm, the research design, the research approach, and the research methodology. Thereafter, the sampling strategy and data generation tools employed in this study are discussed. In addition, guided data analysis was used for analysing teachers' reflections on teaching topography. This chapter concludes by outlining the

limitations of this study, the ethical issues and issues of trustworthiness considered and offers an overall summary of this chapter.

4.2 Interpretivist paradigm

Many scholars define a paradigm as a collection of shared beliefs, assumptions, and agreements amongst researchers who subscribe to the same discipline, which determine how the researchers of that discipline view the world and come to understand problems, which consequently inform how they conduct research and generate knowledge (Alharahsheh & Pius, 2020; Kivunja & Kuyini, 2017; Rahi, 2017; Yong et al., 2021). This suggests that a paradigm is a reflection of one's beliefs and assumptions about how knowledge is constructed. Hence, Lincoln and Guba (2000) view paradigms as human constructions that indicate the philosophical stance of researchers and dictate how they extrapolate meaning embedded in data. In other words, the way in which researchers analyse data is determined by the paradigm guiding their inquiry. There are three commonly used paradigms in educational research (Rehman & Alharthi, 2016). These are positivist, interpretivist, and critical paradigms. Amongst these paradigms, researchers should select the most appropriate one for their study. There are four aspects that researchers should consider when deciding which paradigm to use (Park et al., 2020; Varpio et al., 2020). Researchers need to consider the dominance of the paradigm in a particular body of research, its alignment to the aims of the study, the nature of the study (whether it is exploratory or confirmatory), and the research methods of the study. This suggests that the chosen paradigm for a study should align with some of these issues for it to be considered suitable and beneficial the quality of research.

Considering the four issues raised by Park et al. (2020) and Varpio et al. (2020), this study falls within the interpretivist paradigm. Although extensive research on teachers' reflections uses the critical paradigm (Khoza & Mpungose, 2018; Khoza, 2016; Khoza, 2018; Khoza & Biyela, 2020; Mabuza, 2018), this study employed the interpretivist paradigm because it aims to understand teachers' reflections rather than transforming how they reflect upon their teaching. As a result, this study was exploratory and used data generation tools that allowed for the generating of rich, detailed information. The nature of this study and the research data needed necessitated interpretivism. Alharahsheh and Pius (2020) define the interpretivist paradigm (also known as "constructivism" or "naturalism – Tashakkori and Teddlie, 2003) as

a belief system to qualitative research that considers human beings different from physical phenomena as they are capable of constructing and re-constructing meanings of their lived experiences. As a result, this belief system (interpretivism) advocates that; human beings be explored differently from physical phenomenon; and the context which influences their perceptions be acknowledged. Thus, the interpretivist paradigm was well suited for this study because it afforded the researcher to explore how different teachers reflected on their teaching in their naturalistic context and how the context manifested in teachers' reflections. In other words, this paradigm enabled the researcher to engage with the participants through the use of the reflective activity and interview to ascertain how they reflected on their teaching of topography.

Furthermore, Guba and Lincoln (1989) maintain that the interpretivist paradigm, like any other paradigm, is underpinned by three philosophical stances: ontology, epistemology, and methodology. Ontologically, this paradigm assumes that there is not one reality but multiple realities constructed by different people based on their cultures, circumstances, and time that shape their understanding of existence and truth (Alharahsheh & Pius, 2020). This means that different people may attach different meanings to the same experience. Hence, epistemologically, knowledge is believed to be socially constructed within this paradigm. Thus, geography teachers' reflections on teaching topography may differ due to the beliefs and values that shape their reasoning (Thanh & Thanh, 2015). As a result, methodologically, it is prescribed that researchers should use data generation methods that promote the production of in-depth data within this paradigm to capture the context that influences teachers' reflections (Scotland, 2012). The three philosophical aspects of the interpretivist paradigm further illuminate the compatibility between the nature of this study (exploring reflections) and the chosen paradigm. The current study aimed to understand how geography teachers reflected on their teaching of topography by exploring them in their naturalistic setting and generating rich textual data. Thus, the nature of this study (aims) is accounted for in the three philosophical aspects of the interpretivist paradigm, making it the most suitable for this study.

4.3 Research Approach

According to Williams (2007), there are three research approaches commonly used by researchers, namely, qualitative, quantitative, and mixed-method approaches. While researchers may use any of these approaches, the nature of data (textual, numerical, or both) needed to answer the research question dictates which approach is most appropriate for a research study (Williams, 2007). This suggests that researchers should consider the required research data when deciding on a research method. This study used the qualitative approach. Smith (1996) defines the qualitive approach as an approach to research that allows researchers to obtain a detailed description of a phenomenon by exploring, understanding, and describing how different individuals make sense of the phenomenon in question. The qualitative approach was congruent with the aim of this study as it sought to explore and understand geography teachers' reflections on teaching topography. Therefore, this approach (qualitative) allowed the researcher to generate thick descriptions from geography teachers on how they reflected upon topography teaching. Creswell and Creswell (2017) concur that the qualitative approach allows researchers to provide a description of human experience as it is experienced by the participants (teachers).

Furthermore, Davidson et al. (2019) and Hoeber et al. (2017) argue that one of the major challenges associated with qualitative research is the amount of data it produces. These scholars assert that qualitative research generates large textual data, making data analysis tedious and time-consuming for researchers. To account for this, this study utilised a relatively small sample of four teachers from which teacher reflections on topography teaching were generated. This was necessary to ensure that the extrapolation of inferences by the researcher from the generated data was manageable and represented reflections of geography teachers. Rahman (2020) maintains that using large data samples in qualitative research poses a threat to quality data interpretation and analysis. Therefore, the small sample size utilised in this study ensured rigorous interpretation and analysis of teachers' reflections on teaching topography. However, Harry and Lipsky (2014) as well as Thomson (2011) argued that the issue of a smaller sample size raises concerns about the transferability of the study to a larger context. As a result, this qualitative study provided thick descriptions of the contexts of the schools where the study was conducted and the profile of teachers who participated in the study. This was done to help those who may wish to transfer the findings of this study to a different context to practice that with caution by choosing a context that corresponds with the context of this study (Khoza, 2018).

4.4 Research design

A research design is a systematic and procedural plan developed and used by researchers to generate and analyse data needed to test a research hypothesis or answer a research question (Abutabenjeh & Jaradat, 2018; Adebiyi & Abayomi, 2016; Cresswell, 2012; Polit & Beck, 2014). This suggests that the research design comprises of a sampling strategy, data generation methods, and a data analysis approach that resonates with the research question of the study. Likewise, Durrheim (2006) view research design as a structural plan that displays how different research aspects, such as the research paradigm, the research approach, the research style, the sampling strategy, the data generation methods, and the data analysis approach correlatively fit and work together to bring about an end goal of the research study. This scholar uses an interesting analogy to conceptualise the research design. Durrheim equates the research design to a "house plan", which provides builders with guidelines on how to build the house. He views researchers as "constructors" who ought to identify the requirements needed for the house (research study), how to obtain them, and where to place them. This suggests that researchers must ensure that the research designs they employ are appropriate to the nature of the study as well as the research questions (Meadows, 2003).

This study employed a case study research design. A case study is defined as a method that allows researchers to closely explore a phenomenon within its naturalistic context (Baxter & Jack, 2008; Heale & Twycross, 2018). The phenomenon explored in this study is the reflections of geography teachers on teaching topography. Yin (2003, p. 23) argues that the case study design "helps in investigating a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used". This positions the case study design as the most appropriate approach for this study because it allows for teachers to be explored in their place of practice using different data generation methods. Put differently, the case study allowed me to engage with teachers in their work environment to gain deeper insights into their reflections on teaching topography (Creswell et al., 2006). Secondly, the usage of case study was necessary because this study is interested in a single phenomenon which is geography teachers' reflections on teaching topography. However, there is more than one type of case study designs that researchers may use to explore a problem (Baxter & Jack,

2008). Researchers may choose to use either explanatory, exploratory, descriptive, multiple, or collective case studies, intrinsic or instrumental case studies, depending on the nature of the problem they are studying and their research question (Baxter & Jack, 2008). This suggests that one should ensure that the type of case study design they use is relevant to the purpose of the study (nature of the study) and the type of information required (research question). This study used exploratory case study.

According to Swedberg (2020), an exploratory case study is a case study design used to discover information about unexplored problems. In other words, exploratory case studies are used to develop insights into a problem or phenomenon that is inaccessible in the literature (Yin, 2014). This suggests that the exploratory case study design was the most appropriate choice for this study. This is because the teaching of topography is explored in both local and international literature. Secondly, this study aimed to understand teachers' reflections as it sought to discover teachers' reflections, what informed them, and the lessons embedded in them. Therefore, based on the purpose of this study and the amount of literature available on topography teaching, an exploratory case study was necessary and relevant. Zainal (2007) avers that exploratory, explanatory, and descriptive case studies are easily confused. Thus, researchers may mistakenly use explanatory or descriptive case studies for a problem that required an exploratory case study. The difference amongst these three lies in the fact that exploratory case studies aim to understand an unresolved problem, while explanatory studies explain the problem and descriptive studies describe the problem. Thus, exploratory was an appropriate choice since this study was centred on exploring how geography teachers reflected on their teaching of topography.

4.5 Sampling strategy

According to Sharma (2017, p. 749), a sampling strategy refers to "a technique (procedure or device) employed by a researcher to systematically select a relatively smaller number of representative items or individuals (a subset) from a pre-defined population to serve as subjects (data sources) for observation or experimentation as per objectives of his or her study". This means that a sampling strategy must align with the purpose of the study (Bhardwaj, 2019). Researchers can employ various sampling strategies to select participants for their research studies (Cohen et al., 2011). Though there are numerous sampling strategies, these strategies are grouped into two categories (Cohen et al., 2011). A sampling

strategy can either fall under probability or non-probability sampling. On the one hand, probability sampling refers to a sampling technique where everyone in the population has an equal chance of being selected as the sample of the study. (Acharya et al., 2013). This means that researchers have no control over who gets selected in the study sample. Examples of probability sampling are simple random, stratified random, cluster, systematic, and stage or multi-stage sampling strategies (Pace, 2021). On the other hand, non-probability sampling is defined by Etikan and Bala (2017) as a sampling strategy whereby the researchers set the parameters that determine who gets to participate in the study. This suggests that non-probability sampling involves judgement. Examples of non-probability sampling include convenience, snowball, quota, and volunteer sampling. This study employed non-probability sampling in the form of convenience and purposive sampling techniques.

Convenience sampling is a non-probability sampling method used to select participants that are easily available in the context of the study and willing to participate (Stratton, 2021). For this reason, Etikan et al. (2016) argue that the convenience sampling method is easy and affordable since the participants are readily available. The utilisation of convenience sampling in this study was necessitated by financial constraints. This sampling method allowed the researcher to identify high schools within proximity where geography teachers would be sampled to generate data for this study. Thereafter, the purposive sampling was employed to recruit and sample teachers who meet the inclusion criteria (teaching geography in the FET phase) of this study. Obilor (2023) describes the purposive sampling as a non-probability sampling strategy where the researcher selects only the population unit that meets the objectives of his or her study based on the researchers' judgement. Thus, the purposive sampling allowed the researcher to select one geography teacher in four schools who had taught geography for at least five year, making the total sample of this study to be four participants.

Table 4.1: Participants' Profiles

Participants	**Experience in years**	**Subject**	**Grade**	**Gender**	**Race**
Participant 1	30	Geography	10 – 12	Male	Indian
Participant 2	07	Geography	10 – 12	Female	Indian
Participant 3	09	Geography	10 – 12	Female	Indian

Participant 4	05	Geography	11	Female	Black

4.6 Weaknesses of convenience sampling

According to Mackey and Gass (2015), the most obvious shortcoming of convenience and purposive sampling techniques is biases since the subset is never a true reflection of the entire target population. As such, the findings of the study may be bias. Therefore, the findings of this study may not be generalisable to the whole target population (Henrich et al., 2010; Mackey & Gass, 2015). This suggests that the reflections of geography teachers on teaching topography cannot be taken to represent reflections of all geography teachers in the Chatsworth township. Nonetheless, convenience and purposive sampling was relevant for this study because it allowed me to sample readily available teachers. This helped cut the financial costs of conducting this study.

4.7 Data generation methods

Jackson et al. (2007) define data generation methods as the tools, procedures or techniques researchers use to generate data for a research study. This study utilised the reflective activity and semi-structured interviews to generate data. These data generation tools aligned with the research questions and the philosophical underpinnings of the study (interpretive paradigm and qualitative approach) (Csikszentmihalyi, 2011; Mhango, 2018).

4.7.1 Reflective activity

In this study, the reflective activity permitted geography teachers to independently reflect on their practices of teaching topography (Mpungose, 2017). The participants responded to the reflective activity in the comfort of their own space, without the researcher. The reflective activity used open-ended questions adopted from the curricular spider web (CSW). This afforded teachers the freedom to answer the questions of the reflective activity the way they saw fit, allowing for the generation of in-depth responses thus fulfilling the main purpose of qualitative research (McGuirk & O'Neill, 2016). Over and above that, the CSW questions allowed geography teachers to reflect on all the curriculum aspects that influence how they implement topography teaching (rationale, accessibility, teaching goals, content, teaching

activities, teaching strategies, teacher role, resources, and assessment). The reflective activity allowed geography teachers to interrogate their past and recent episodes of teaching topography. This motivated them to construct new meanings from their experiences. The reflective activity requested that geography teachers reflect on the set of questions represented in table below.

Table 4.2: Reflective Activity informed by CSW Framework

Themes	Questions	Prepositions teachers are expected to reflect on.
Rationale	Why are you teaching topography?	1. Personal rationale (pedagogical) 2. Content rationale. 3. Societal rationale.
Accessibility	Who is teaching topography?	1. Physical access 2. Financial access 3. Cultural access
Goals	Which goals are you teaching topography towards?	1. Aims 2. Objectives 3. Outcomes
Content	What content are you teaching in topography?	1. Topics 2. Fieldwork 3. Content knowledge
Teaching activities	Which activities are you using to teach topography?	1. Informal task 2. Formal task 3. Continuous task
Teaching role	How do you see your role in teaching topography?	1. Teacher-centred 2. Learner-centred 3. Content-centred
Resources	What resources are you using to teach topography?	1. Hardware 2. Soft ware 3. Ideological ware
Location and time	Where and when are you teaching topography?	1. Teaching hours 2. Teaching space 3. Internet
Assessment	How are you accessing learners in topography?	1. Formative assessment 2. Summative assessment 3. Continuous assessment.
Accessibility	Who are you teaching topography?	1. Physical access 2. Financial access 3. Cultural access

As Csikszentmihalyi (2011) and Mhango (2018) suggested, the reflective activity helped the researcher expose teachers to the data generation questions that guided this inquiry before the implementation of the main data generation method. Thus, the reflective activity propelled

geography teachers to briefly reflect on their teaching of topography. Teachers were expected to reflect on topography teaching based on the prepositions offered in Table 4.1, which are supported by the literature of Chapter 3. These prepositions helped me understand if teachers were adequately reflecting on their teaching. For each question of the reflective activity, teachers' reflections had to demonstrate three propositional understandings. Teachers' responses to the reflective activity assisted me in understanding teachers' reflections, what informed them, and the lessons we can learn from them. Thus, the reflective activity assisted in generating research data needed to answer the three research questions of the current study. However, their responses to the second and third research questions (what informs teacher reflections and what lessons can be learned) did not yield adequate data. Hence, the study employed another data generation method (semi-structured interviews) to supplement the reflective activity. Further, the reflective activity also assisted me in identifying the level (technical, practical, or critical) at which geography teachers reflected on their practices of teaching topography (Mpungose, 2017). This implies that the use of the reflective activity as the primary data generation method of this study was essential.

The reflective activity was informed by the CSW concepts. Thus, the questions of the reflective activity were mainly the complementary questions of the CSW concepts and geography teachers had to reflect on those questions. Although the reflective activity is thought to be the easiest data generation method to administer and less time-consuming Jones et al. (2008), as well as Munn and Drever (1990), contend that these advantages are usually restricted to questionnaires with closed questions. They argue that questionnaires with open-ended questions may yield responses that are distinctly different and hard to analyse and categorise. The reflective activity used open-ended questions. Though participants provided somewhat different responses, analysing and categorising the responses was relatively easy as the responses were coded according to the curricular spider web diagram and levels of reflection in Van Manen's framework. A table depicting how this was done is included in the data analysis section. Marshall (2005) and Munn and Drever (1990) maintained that questionnaires yield descriptive rather than explanatory responses. This suggests that participants may describe what they do when they teach without explaining why they do what they do when teaching. This limitation was accounted for in this study by using one-on-one semi-structured interviews where the researcher was able to follow up on answers that raised more questions.

Furthermore, Munn and Drever (1990) argue that the reflective activity deprive researchers of a chance to observe and provide guidance to the participants as they respond to the questionnaires. This is because participants complete the questionnaires in the absence of the researcher. Questionnaires may also yield socially acceptable answers or be completed by someone other than the participant (Patten, 2016). This suggests that participants may provide answers that they may think would entice the researcher. The one-on-one semi-structured interview served as means to back up data generated through the reflective activity in case any of the discussed limitations of questionnaires interfered with the participants while responding to the reflective activity.

Teachers were given five days to complete the reflective activity (questionnaires). Teachers were offered more time to respond to the questionnaires to ensure that their responses were honest and not impulsive (Cohen et al., 2011). I encouraged teachers to be professional when answering the reflective activity and keep their answers concise as there was limited space for each question – though they were allowed to use extra writing material, if necessary. Further, I also encouraged teachers to relate the reflective activity questions to their past and present teaching experiences and use those experiences to think of how they could improve their future teaching of topography. I also gave teachers permission to consult other materials if there was a question they did not understand. This was done to ensure that participants' responses were not restricted by their lack of understanding of the question, which might have negated the quality of data generated.

4.7.2 One-on-one semi-structured interview

A semi-structured interview is defined by DiCicco-Bloom and Crabtree (2006) as a tool that allows for the in-depth production of data by allowing research participants to articulate their views. This study employed one-on-one semi-structured interviews as the second data generation tool. This tool allowed the researcher to probe the way in which geography teachers (participants) reflected on teaching topography. For this reason, Séraphin et al. (2013) view the semi-structured interview as a very powerful and flexible tool for generating rich data, allowing researchers to elicit participants' responses. This data generation tool also permitted me to extract non-verbal responses from our conversations, such as emotions, body language, and silence. These non-verbal responses assisted me in making inferences during

the data analysis stage (Ritchie et al., 2013). This illuminates that semi-structured interviews are perfectly suited for qualitative research because they allow the researcher to gather in-depth data on teachers' reflections and allow for teachers (participants) to be explored in their naturalistic setting (Kakilla, 2021). The semi-structured interviews were also the most suitable choice for this study because they are congruent with the philosophical stance of this qualitative research (interpretive paradigm) regarding how knowledge is produced. They allowed participants to participants to construct different meanings of their experiences and share these meanings with the researcher. It is the main assumption of interpretivism that knowledge is a social construct.

The one-on-one semi-structured interviews helped in answering the second and the third research questions adequately: What informs geography teachers' reflections on teaching topography, and what lessons can be learned from geography teachers' reflections on teaching topography? This is because semi-structured interviews allowed the researcher to probe participants, gaining deeper insights into geography teachers' reflections and understanding the rationale that informed their reflections (Ryan et al., 2009). The rationale forms the central part of the curricular spider web. This means that teachers' reflections on every concept of the curricular spider web should be informed by the rationale. The semi-structured interviews allowed the researcher to follow up with teachers on their reflections to understand whether or not their reflections were underpinned by rationale or vision.

Although a semi-structured interviews were an important tool for generating data for this study, they had their own fair share of limitations. Doody and Noonan (2013) argue that one of the common drawbacks of semi-structured interviews is that novice researchers are often unable to know where to probe responses, which may lead to relevant data to be not gathered. To avoid this from interfering with the validity of the current study, as a novice researcher myself, I used the responses generated in the reflective activity to develop an interview guide (Jiménez, 2014; Rubin & Rubin, 2011). DiCicco-Bloom and Crabtree (2006) maintain that interview guides are essential when interviewing an individual or group of people. They provide structure and focus to the interview (Rubin & Rubin, 2011). The interview guide used in this study comprised of possible probe questions. The interview guide questions were

not used as standard interview questions but as a reference of what needed to be addressed in the semi-structured interviews (Brinkmann & Steinar, 2015; Corbin & Strauss, 2015).

One-on-one semi-structured interviews were the most suitable for this study and addressing the shortcomings of the reflective activity. Each geography teacher was interviewed after school to avoid disturbing the teaching and learning process of the schools. The interviews lasted for an hour to ensure all interview questions were adequately addressed and probed where necessary. The interviews being conducted in person made it easy for participants to seek clarity in ambiguous questions. This improved the quality of data. The interviews were conducted in an informal manner to ensure that teachers (participants) were comfortable and relaxed, which is instrumental in generating honest data (Cohen et al., 2011). At the begging of each interview, teachers were asked general questions that prompted them to reflect on their experiences of teaching geography. This was done to ensure that teachers were relaxed and alert before engaging in the interview. After not more than five minutes of general discussion, teachers were reminded of the purpose of the interview and their rights as participants and advised to ask if they had any questions. All teachers (participants) agreed to have their interviews recorded. The interviews were recorded with a cell phone due to financial constraints. This ensured accurate transcription and analysis of data.

4.8 Data analysis

According to Wahyuni (2012), data analysis is the stage where researchers ought to analyse and interpret the generated data to draw inferences in an attempt to address the research question or verify the hypothesis. This suggests that during data analysis, one has to analyse the large dataset to summarise it by extrapolating meaningful insights embedded in the generated data. The process of data analysis happens in three sub-processes: data reduction, data display, and data conclusion and verification (Miles & Huberman, 1994). This suggests that during data analysis, researchers must transcribe and scrutinise the generated data and sort it into codes or categories (data reduction) and look for patterns between these categories (data display) in order to draw conclusions and make sense of the data (conclusion and verification) (Cohen et al., 2011). There are various ways researchers can go about analysing qualitative data (Wong, 2008). The commonly used approaches to data analysis in qualitative research are content analysis and thematic analysis. However, this study used a guided

qualitative approach. It was essential to use this approach (guided analysis) in this study because the literature review (see chapter three) and the data generation procedure (see data generation tools) were guided by the curricular spider web. As a result, the data analysis had to be informed by the curricular spider web as well to ensure coherence in this process. Therefore, the guided data analysis was relevant to this study because it allowed the data to be analysed according to the concepts that informed data production and negotiated a place for the findings of the current study in the existing research on teachers' reflections on teaching topography. This therefore positions guided analysis as the sensible and inevitable data analysis approach for the current study.

Armat et al. (2018) maintain that guided data analysis uses deductive and inductive reasoning concurrently to draw conclusions from generated data. This is apparent in the definition offered by Dhunpath and Samuel (2009), who define guided analysis as an approach to analysis that uses categories adopted from a theory or concepts (deductive reasoning) that inform the framework of the study and these categories are modified through interaction with the data (inductive reasoning). Elo and Kyngäs (2008) argue that deductive reasoning relies on theories to make conclusions, while inductive reasoning relies on specific observations. Though deductive and inductive were used almost concurrently in this study, the analysis leaned more towards inductive reasoning. Therefore, in the data analysis process, the researcher started by observing the generated data to make conclusions (inductive reasoning) and later located the inductively formed categories to their respective the curricular spider web concepts (deductive reasoning) (Dhunpath & Samuel, 2009).

Furthermore, Christiansen et al. (2010) echoed that in inductive reasoning, researchers have to begin with analysing the raw data gathered from participants and, from there, discern patterns from the raw data in order to draw conclusions. Therefore, to arrive at the findings of this study, I started by repeatedly reading participants' responses from the questionnaires and the transcribed interview data while making notes of the items that stood out in the responses. The notes assisted me in assigning codes to participants' responses. Cohen et al. (2011) define this process as open coding, which allows researchers to assign a new label to a piece of text to describe and categorise that piece of text. The codes were revised twice to enhance inductive reasoning and ensure all relevant responses were captured and that the codes

emerged from the data. Following this, I grouped all similar codes together. This helped to reduce the amount of data and establish the themes or categories that emerged from the generated data (Christiansen et al., 2010). To draw conclusions for this study, the categories were then scrutinised for patterns, interpreted, and presented to highlight the patterns that exist in participants' responses and the meanings embedded in the patterns. Christiansen et al. (2010) define these two steps as conclusion drawing and data presentation. I used direct quotations of participants' responses to enhance the credibility of the conclusions. In addition, deductive reasoning inherently informed the data analysis of this study, as participants' responses were originally arranged according to the curricular spider web diagram. Therefore, the same concepts were employed as categories of the generated data and these concepts (categories) were used in data presentation (see Chapter 5).

4.9 Limitations of the study

It is virtually impossible for a research study to be without limitations. Price and Murnan (2004) describe the limitations of a study as uncontrollable systematic bias that could potentially affect the results of the study. Two serious drawbacks were encountered in carrying out this study. Both these drawbacks lay in data generation. Out of the four sampled schools, one school had recently phased out the geography subject. Thus, they no longer had a geography teacher at the school. However, among the other schools, one school had two geography teachers, and both teachers were recruited to counteract the sudden shortfall of participants. The sampling of two teachers in one school was permissible within the convenience sampling technique utilised in the study. Further, one participant withdrew from the study, forcing the researcher to seek a replacement participant from another school. Besides the two drawbacks relating to data generation, the sample size of this study introduces a systematic bias, as Price and Murnan (2004) defined it. This study comprised a relatively small sample (four participants). As a result, its findings are subjective, personal, contextual, and not generalisable to a wider population or context (Mackey & Gass, 2015).

4.10 Ethical issues

Ethical issues were considered in this research project before the commencement of data generation from the participants. Ethical considerations/issues are defined by Fleming and

Zegwaard (2018) as the requirements or guidelines that researchers must adhere to or follow to ensure that the research is conducted ethically. Meaning that there is no form of deception, harm, exploitation, and the research is approved by the research committee. As such, I applied for and obtained ethical approval from the University of KwaZulu-Natal human social sciences research ethics committee before conducting this study. The gatekeeper's permission was also sought and obtained from the Department of Education as the study involved schoolteachers (participants). In addition to that, participants were also given an informed consent form to complete.

In the informed consent forms, a detailed information was provided for participants to inform them of the nature of the study, the reasons for which the study is conducted, how will the data be used, and their freedom to withdraw or stop participating in the study without any negative consequences (Cacciattolo, 2015; Fleming & Zegwaard, 2018). The informed consent form informed the participants of their basic rights that should the participant wish to stop participating after the commencement of the study; they could withdraw without further questioning or any negative consequences. Additionally, the informed consent form further detailed that there would be no compensation or financial gain for participation in this study. It also explained that the participants' names and the names of the schools they worked in were not going to be disclosed. Rather, the study would use pseudonyms such as Participant 1, 2, 3, 4 to ensure anonymity and confidentiality. Further, participants were informed that all the material pertaining to the discussions held with them would be stored in a secure place and destroyed after five years and that only the researcher and the supervisor would have access to that information. Upon issuing the informed consent form, the participants were also advised to read the form carefully and thoroughly before appending their signatures.

4.11 Issues of trustworthiness

According to Anney (2014), trustworthiness refers to the extent to which the methodological elements of a study, such as the research approach, the research design, data generation, and data analysis, are compatible and coherently aligned, and the interpretation of the findings is accurate and honest to ensure the soundness of the study. This means that for a study to be considered trustworthy, it must be carried out rigorously (Merriam, 2009). Thus, trustworthiness is a way for researchers to convince readers that their study is of high quality and worth of consideration (Lincoln et al., 1985). There are four issues that researchers need

to pay attention to in order to achieve trustworthiness in their study (Guba, 1981; Sandelowski, 1986). These are credibility, transferability, dependability, and confirmability.

4.11.1 Credibility

Graneheim and Lundman (2004) argue that credibility is concerned with whether the findings of a study are accurate and present correct interpretations of the participants' original responses. This means that credibility aims to establish that the findings of a research study reflect the reality and lived experiences of those from whom the raw research data was generated. In this study, credibility was maintained through data triangulation – the use of more than one data generation tool (Cohen et al., 2011). This study used the reflective activity and semi-structured interviews. To strengthen the credibility of this study more, the transcriptions of the generated data were sent to the participants to ensure their reflections were transcribed accurately (Amankwaa, 2016; Korstjens & Moser, 2018). This was done to ensure that the interpretation and conclusions reflected the original opinions of participants.

4.11.2 Transferability

According to Graneheim and Lundman (2004), transferability is the extent to which the findings of one study may be applied to different contexts, groups, individuals, or settings. Transferability is concerned with whether the findings of a research study may be transferred or generalised to a larger population (Krefting, 1991). Though this study used convenience sampling and selected a relatively small sample size, thick descriptions of participants' contexts were provided to ensure that if other researchers apply or transfer the findings of this study, they will be able to choose a relevant context similar to the one of this study (Khoza, 2018). To enhance the transferability of this study, teachers reflected on topography teaching based on the curricular spider web concepts. This suggests that the four teachers sampled in this study followed the same procedure to reflect on topography teaching within the CAPS curriculum. This means that the findings of this study can be cautiously transferred to other contexts where teachers teach topography under the CAPS curriculum policy.

4.11.3 Dependability

Dependability, according to Bitsch (2005) as well as Tobin and Begley (2004), is concerned with the consistency of findings if the research was to be replicated under similar conditions. This means that for a study to be deemed dependable and valid, it should yield similar findings when replicated with similar participants in similar conditions following the same research methods used by the original researcher (Koch, 2006). Therefore, dependability can be ensured by providing correct and direct information in the study (Krefting, 1991). In this study, dependability was enhanced by providing direct quotations in the data analysis to support my interpretations of participants' reflections. Thus, other researchers may access the findings for themselves and decide on the soundness of the interpretations. This study also used two data generation tools to ensure the accuracy of the generated data by comparing the findings of both data generation methods to one another. The interviews were also recorded to ensure the accurate transcription of data.

4.11.4 Confirmability

According to Shenton (2004, p. 72), the concept of confirmability in qualitative research seeks to "ensure as far as possible that the work's findings are the result of the experiences and ideas of the informants, rather than the characteristics and preferences of the researcher". This means that confirmability is concerned with objectivity (Shenton, 2004). To enhance confirmability of the findings of this study, the interviews were recorded, transcribed, and interpreted repeatedly to ensure the interpretations were not influenced by the researchers' ideas or predictions. The interpretations were also sent back to the participants for member checking to ensure that the interpretations reflected their responses and experiences as opposed to the ideas of the researcher (Amankwaa, 2016; Korstjens & Moser, 2018).

4.12 Conclusion

This chapter discussed the research design and methodology of this study. It managed to do this by describing research paradigm, the research approach, the research design, sampling strategy, data generation methods, data analysis, limitations of the study, ethical issues, and issues of trustworthiness. The selection or use of these methods was also justified in this chapter. Collectively, these methods provided direction for exploring geography teachers'

reflections on teaching topography. The following chapter will unpack the findings and discussions of this inquiry by following the data analysis outlined in this chapter (Chapter 4).

CHAPTER FIVE

Data presentation and discussion of findings

5.1 Introduction

The previous chapter (Chapter 4) presented the research design and methodology used in this study. This chapter embarks on revealing the findings of the data that were generated through the reflective activity and semi-structured interviews. The findings are presented following the curricular spider web (CSW) concepts, which served as the conceptual framework of this study. The CSW concepts were used as themes in presenting the findings of the data generated from four conveniently sampled participants from township Indian schools in Chatsworth. The participants were given pseudonyms Participant 1, 2, 3, and 4 to protect their identities. However, verbatim quotes from participants' reflections are provided to support the research findings of this study. The verbatim quotes are drawn from the data generated through one-on-one semi-structured interviews and triangulated with data collected through the reflective activity.

5.2 Findings and Discussions

According to Simpson (2015), data analysis is an important stage of a research study. In this stage, researchers should develop a plan that will guide them in analysing generated data to ensure the accuracy of their findings (Simpson, 2015). The table provided in **Figure 5.1** outlines the specific plan the researcher used in analysing and making sense of the findings of this study. As evident in the table, the CSW concepts were used as themes to arrange participants' reflections. The guiding questions of the ten concepts were posed to participants to gather their reflections. The third column of the table depicts the three categories per concept that participants were expected to reflect on. Each of these categories denote a certain level of reflection. In other words, the categories helped the researcher deduce which level participants were reflecting on in their reflections.

Table 5.1: Showing the data analysis plan.

Themes	Questions	Categories teachers are expected to reflect on.	Teachers' level of reflection demonstrated by the CSW prepositions.
Rationale	Why are you teaching topography?	1.Personal rationale (pedagogical) 2. Professional rationale 3. Societal rationale	1. Technical level 2. Practical level 3. Critical level
Accessibility	Who is teaching topography?	1. Physical access 2. Financial access	1. Technical level 2. Practical level

		3. Cultural access	3. Critical level
Goals	Which goals are you teaching topography towards?	1. Aims 2. Objectives 3. Outcomes	1. Technical level 2. Practical level 3. Critical level
Content	What content are you teaching in topography?	1. Topics 2. Fieldwork 3. Content knowledge	1. Technical level 2. Practical level 3. Critical level
Teaching activities	Which activities are you using to teach topography?	1. Informal task 2. Formal task 3. Continuous task	1. Technical level 2. Practical level 3. Critical level
Teaching role	How do you see your role in teaching topography?	1. Teacher-centred 2. Learner-centred 3. Content-centred	1. Technical level 2. Practical level 3. Critical level
Resources	What resources are you using to teach topography?	1. Hardware 2. Software 3. Ideological ware	1. Technical level 2. Practical level 3. Critical level
Location and time	Where and when are you teaching topography?	1. Teaching hours 2. Teaching space 3. Internet	1. Technical level 2. Practical level 3. Critical level
Assessment	How are you accessing learners in topography?	1. Formative assessment 2. Summative assessment 3. Continuous assessment.	1. Technical level 2. Practical level 3. Critical level

5.2.1 Why are you teaching topography?

Theme 1: Teaching rationale

The teaching rationale question sought to understand geography teachers' reasonings for teaching topography. Drawing from interviews, participants' reflections on the teaching rationale indicated that they were teaching topography because it is part of the geography curriculum. This seems to suggest that participants were strongly driven by professional reasoning more than their personal and societal reasonings to teach topography. As a result, they reflected mainly from the practical level of reflection. This is evident in the following examples:

> *"…it's prescribed. It's a compulsory component. We do not have a choice. We cannot choose to teach only theory and leave out mapwork or vice versa…Also, remember learners do not live in a vacuum. They are part of society, and they live in a real world…so, what we are doing is facilitating the learning process so that learners are able to take reality and be able to identify and work with it in that model or in that*

map…and apply theoretical knowledge because mapwork is not a subfield of geography that exists completely on its own…" (Participant 1).

"Basically, teaching topographical maps has been part of our geography curriculum. But we teach the topographical maps so that learners have the basic knowledge on how to interpret maps…" (Participant 2).

"Basically, you want them to understand the topography of the land because we're looking at the land. It seems they should know the differences in rural areas and the differences in urban areas, but sometimes they do not understand. So, I tell them that what you're learning on this map is where you're living and what you're experiencing. That's why we have to do mapwork." (Participant 3).

The above reflections from Participants 1, 2, and 3 suggest that they were teaching topography because it is prescribed in the geography curriculum. This suggests that these participants repressed their personal and societal beliefs regarding the teaching of topography and taught everything that is included in the geography curriculum. Participants shared similar reflections on the reflective activity. They explained that they taught topography because it is part of the geography curriculum. Others (Participants 1 and 3) further articulated the learning outcomes for teaching topography which were derived from CAPS stipulations. This suggests that participants were teaching topography because it is what they were expected to teach as geography teachers. Thus, they did not transform the curriculum. This corroborates the assertion by Khoza and Manik (2016) that teachers who rely more on curriculum stipulations tend to implement the curriculum in a rigid manner. Mpungose (2020) concurs that teachers' over-compliance to curriculum prescriptions causes contextual mismatch. This suggests that teachers who solely rely on curriculum prescriotions may fail to contextualise the curriculum according to societal challenges. Hence, Makumane and Khoza (2020) recommend that teachers should reflect on all three teaching rationales to be able to adapt the intended curriculum to their contextual and personal needs. However, reflections from these participants suggest that they were reflecting only from the professional rationale as their reasonings for teaching topography were influenced by the intended curriculum. This suggests that participants taught topography to impart topographic skills suggested in the CAPS policy. They did not think beyond the suggested topographic skills.

However, Participant 4 shared reflections that demonstrated the societal and personal rationales. While she taught topography because it was a prescribed curriculum, she also expressed passion for it, as evident in her reflections:

> *"It's part of the curriculum. But I also feel like the topographical map will give learners a better understanding of the places that we study in maps because most of them are based in South Africa. Sometimes you find that some would relate to or have been or heard about that place…I enjoy it at the same time I find it difficult for learners because you'll find that some of the things don't make sense to them…so to you as a teacher there's that challenge of how do I make it easy and understandable for them…"*

Participant 4's accounts suggest that she was driven by both the professional and personal rationale in her teaching of topography. While she followed the curriculum prescriptions like the other participants (professional rationale), she also had a passion for teaching topography (personal rationale). Her passion for topography allowed her to transform or simplify the content knowledge of topography to match learners' level of understanding. However, in the reflective activity, she expressed only professional reasons as she explained that she taught topography because it was part of the curriculum (professional rationale). Evidently, her passion for teaching topography was mostly pronounced when she experienced challenges in teaching. Thus, her love for topographic maps allowed her to handle challenges. In support of this, Mpungose (2015) contends that the personal rationale allows teachers to effectively implement the curriculum as it drives them to find better ways to deliver the content. Thus, the personal rationale helps teachers cope with challenges associated with teaching (Khoza, 2015b). According to Makumane and Khoza (2020), teachers can construct their personal rationale either through the professional or societal rationale or both. This suggests that Participant 4 constructed her personal rationale through the professional rationale, as her reasonings for teaching topography were closely tied to the curriculum prescriptions of CAPS. Unlike other participants who demonstrated only professional rationale, participant 4 was able to interpret the intended curriculum and adapt it according to her needs rather than just implementing it as it was prescribed. This suggests that her teaching of topography was flexible and depended on professional and personal knowledge.

In addition to the above, participants' were mostly compliant with curriculum prescriptions in their teaching of topography. This suggests that they constructed their reflections through the professional rationale. Thus, they were reflecting from the practical level of reflection. Van Manen (1977) and Taggart and Wilson (2005) argue that at this level of reflection, teachers should be concerned about why they choose to teach what they teach in a particular way. This suggests that in practical reflection, teachers should be able to defend and justify their teaching approaches. Participants used curriculum stipulations to justify their teaching. Their reflections did not demonstrate personal reasons (technical reflection) for teaching topography or societal reasons (critical reflection). This suggests that they were unable to reflect from the technical and critical levels of reflection. Instead, their reflections were mainly based on what the curriculum prescribed (practical reflection). Taggart and Wilson (2005) argue that teachers who base their reflections on the ideas and assumptions of curriculum designers and do little to transform the intended curriculum are not reflecting critically upon their practice. This suggests that teachers unable to think beyond curriculum prescriptions by engaging in critical reflection may not be able to teach topography effectively. They may fail to find better ways to make topography understandable to learners. Thus, the way they choose to teach topography may not be sensitive to the context or learners' needs.

Furthermore, in reflecting on the teaching rationale, participants reflected mostly from the practical level as they lean more towards the professional rationale in their reflections. This suggests that these participants were not familiar with the concept of reflections. However, one participant who held a Master's degree in education was able to reflect from the technical level by negotiating her teacher image in the intended curriculum. Thus, she did not reflect only what she was required to teach but considered how she could best deliver the content based on her personal experiences. This suggests that there may be a correlation between teachers' educational level and their ability to reflect on their practice. A study conducted by Ngololo and Kanandjebo (2021) confirms that undergraduate programs do not adequately train teachers to reflect on their practice. As a result, they hardly engage in reflective practice in their in-service teaching. This suggests that, to improve the quality of education, teacher training programs should ensure that prospective teachers are adequately capacitated on the importance of reflection in education by incorporating the reflective practice as a daily activity in all their undergraduate modules until they complete their degrees.

5.2.2 How are they teaching topography?

Theme 2: Accessibility

The concept of accessibility sought to understand how teachers accessed the teaching of topography. Participants were expected to reflect on physical, financial, and cultural factors which may influence teaching. In the reflective activity (questionnaires), participants mostly mentioned teaching resources (physical factors) while they overlooked the financial and cultural aspects. This suggests that teachers did not fully understand the concept of accessibility despite being advised to consult other sources when reflecting on the questionnaires. This suggests that participants might not have seen the importance of this study to their teaching. However, during the interview, participants were able to reflect on the physical and cultural aspects of accessibility as they were provided with a description of the concept. In reflecting on physical factors, participants shared diverse reflections. For Participants 3 and 4, the school was easily accessible because they stayed close to the schools where they taught. This is evident in their reflections:

> *"I'm quite near school. I'm kind of lucky and it's like 15 minutes away. So that's fine. I have no issues getting to school. And I drive to school" (Participant 3).*

> *"It's a walking distance. It's just about 5 minutes walking distance. It's close. Most of the time I drive because sometimes you find that it's not safe, especially if you'll leave school late because you're usually alone. Unless I know I will leave on normal school time then I can go. But it's not safe if you leave around 4pm" (Participant 4).*

The above reflections from Participants 3 and 4 suggest that urban schools where they worked were easily accessible. As such, the participants did not have to travel long distances to their schools and used their personal cars without any issues. In the reflective activity, these participants also expressed having enough maps to teach topography in their schools. These findings are in line with the assertion by Dichaba and Ndandani (2013) that urban schools are much more accessible and better equipped with resources than rural schools. Khoza (2013a) argue that teachers need teaching resources to be able to communicate the curriculum effectively. As such, Du Plessis and Letshwene (2020) argue that the availability of resources in urban schools has attracted many teachers to work in urban areas. This suggests that there may be job satisfaction in urban schools due to easy access to teaching

resources and schools leading to effective teaching. However, it should be noted that working in urban schools has its own challenges. Reflections from Participant 4 suggest that her predilection for driving to school despite staying within 5 minutes away was heightened by the crime rates in the area. Seemingly, she preferred to drive because the car provided protective barrier from criminals. This suggests that she feared walking to school. These findings corroborate with the contention by Xulu (2023, March 9) that South African school teachers are targeted by criminals for hijacking and robbery. A study conducted by Breetzke and Edelstein (2020) in Khayelitsha, a township located on the peri-urban of Cape Town, to explore crime generators around schools, recreational hubs and transport interchanges of the township confirms that schools have become highly crime-infested recently. Ross and Rasool (2019) concur that crime has become widespread in South African schools, and there is little intervention from the police to combat this problem. This suggests that though the government has managed to ensure adequate availability of schools in urban and peri-urban areas to improve access to education, it has failed to make schools safe and secure for teachers. As such, teachers are restricted in accessing the schools as they must be vigilant about when they go to or leave the school. This suggests that they may also be restricted to teaching topography within the classroom setting and not able to take learners outside the school premises to teach topography in a real-life context.

Nevertheless, Participant 2 shared reflections that were different from that of Participants 3 and 4. In reflecting to physical factors she stated that:

> *"I stay quite far and the only challenge I experience is traffic congestion…How does this affect me as a person? I'm gonna be late to work. I'm going to get a salary cut. I'm probably going to gt a warning from my principal. I have to get extra hours to fulfil for the hours I have missed…"(Participant 2).*

For Participant 2, the school in which she taught was not easily accessible as it was located very far from where she stayed. However, she had resigned herself to driving long distances to work because she could not relocate to areas near the school, as she mentioned that she had children while reflecting on another aspect of accessibility. In the reflective activity, her reflections indicated that she had enough resources to teach topography. Seemingly, distance to school was the only physical challenge for Participant 2. These findings contradict the assertion by Muremela et al. (2021) that urban schools are easily accessible to teachers due to

well-developed roads and readily available accommodations in urban areas. Olayode et al. (2020) argue that traffic congestion is a serious problem in South Africa. Teachers who stay or work in cities find travelling to their workplaces during peak hours difficult. According to Sewpaul and Pillay (2011), in Chatsworth communities, traffic is exacerbated by the narrow roads, fast-growing population and emerging industries. A study by Adebambo and Boye (2015) conducted in Ghana found that traffic congestion may lead to workers' job dissatisfaction, lack of innovation, efficiency and effectiveness in carrying out their duties. Though these findings were extrapolated from a different context, they corroborate with the reflections from Participant 2. This suggests that school location may also hinder effective teaching in peri-urban areas, however, to a lesser extent compared to rural areas. While some teachers may opt for renting to avoid this challenge, reflections from Participant 2 show that elderly teachers may be less likely to take advantage accommodation availability due to family responsibilities. Such teachers may end up losing their teaching hours to traffic. As a result, they might end up not having enough time to teach topography.

However, Participant 1 shared the following reflections in reflecting to physical factors:

> *"In terms of accessing the school, that's not a problem because all of us has contextual factors. It is my personal situation if it takes me half an hour to work and back. But it does not impact my delivery and my teaching at the school."*

The reflections of Participant 1, who had taught geography for over 30 years, suggest that he was resilient in handling problems that threatened to interfere with his teaching. Seemingly, he believed that a strong professional teacher identity should assist teachers in managing situational circumstances that may affect their teaching. However, in the reflective activity, Participant 1 shared reflections that indicated neither physical, financial, or physical factors. This suggests that he initially misunderstood the concept of accessibility, but was able to articulate his resilience after being given a description of accessibility. Day and Gu (2013) argue that resilience informs effective teaching because resilient teachers are often driven by their sense of purpose to do their best regardless of adversities in their teaching contexts. Teachers socially construct resilience based on their personal and professional values and contextual factors (Day et al., 2007). "Being a resilient teacher goes beyond mere survival on an everyday basis. Teaching to their best across a career span of 30 years or more requires that teachers are able to exercise 'everyday resilience' that classroom conditions inherently

demand" (Flores, 2018, pp. 24-25). This suggests that teachers characterised with strong professionalism and schools where resilience and professionalism are encouraged, teaching is more likely to be implemented effectively regardless of the contextual problems of teachers or the school. Thus, resilient teachers would be able to teach topography in whichever way they are required to regardless of any challenges that may impede others.

Regarding the cultural aspect of accessibility (which denotes critical reflection), participants' reflections indicated that they were all aware of the cultural differences that influenced how they taught topography. Some participants were able to adapt their teaching to accommodate cultural differences amongst learners while others were frustrated. This is evident in the reflections of Participant 3, who stated that:

> *"…There is issues with racism…the type of respect they will give an African educator becomes different from the one that they will give to me…It's not because of me. But generally, the households they come from they've been taught, they've been adapted, this is the way they think…it's a challenge for us that I'm really afraid to address the child's issue. I'm scared to even say you're not doing the right thing…so that's one issue in teaching and discipline because if a learner doesn't respect you, there's no way you can teach them anything in the classroom…"*

Additionally, Participant 3 further stated that:

> *"…They struggle with English. Lots of them fail English…and geography is a language on its own. There is English but there's like different genres, different words you're gonna use to understand it. Now, they don't understand their basic English, it becomes hard to teach them in a scientific level of English. So, when I'm teaching, I find it difficult to explain things because they're not taking it the same way as if somebody said them to them in their language - IsiZulu. So, language is a problem…"*

The above reflections from Participant 3 suggest that cultural differences presented a huge challenge in her classroom. For this participant, it was much easier to teach a learner of their own ethnicity rather than a learner of a different ethnic orientation. Participant 3's reflections suggest that there were communication problems between her and African learners due to cultural divide. These findings corroborate with the assertion by Alexander and Mpisi (2014) that though post-apartheid education had improved access to education through integration

policies, cultural differences learners between teachers and learners in Indian and Ex-Model C schools have hampered these efforts. Teachers in these previously racially pure schools were not trained to teach in a multicultural context, and they find it difficult to adapt their teaching to accommodate learners of different ethnicities. As a result, African learners were disenfranchised from participation due to the lack of presentation in the curriculum (Hooijer & Fourie, 2009). This suggests that although physical access to education has improved dramatically for the previously marginalised groups in urban areas, cultural access to education is still a major challenge to effective integration and teaching. Thus, teachers who teach in multicultural schools may struggle to teach topography to second-language learners because they might find it difficult to decipher domain-specific concepts. For instance, learners may be familiar with topography features like slopes, mesas, buttes, mountains, and hills etc, but get confused by these terminologies.

Participant 2 agreed with Participant 3's reflections regarding the language barrier being a concern in teaching topography. In her reflections, she stated that:

> *"There was a child in my class that was Indian-based, and he spoke in the Hindi language. So, aside from looking at a black learner that spoke isiZulu at home, here was an Indian learner that spoke Hindi…it was very difficult for him. His pronunciation of words was hard. And sometimes when I spoke, he battled to understand…but I think when you are a teacher, you learn to bring it down to their standard."*

The reflections from participants 2 and 3 suggest that the language barrier is a challenge in multicultural or linguistically diverse schools. Seemingly, teachers struggle to make topography content accessible to learners whose first language is not English. According to Department of Basic Education (2011), English is the language of learning and teaching (LOLT) in South African schools. However, Maluleke (2019) reports that many South African learners grapple to understand ideas presented to them in a language that is not their mother tongue. Alexander and Mpisi (2014) argue that the language barrier affects African learners as many have limited exposure to the English language. This corroborates Participant 3's reflections, who felt powerless to teach topography to African learners because she could not teach it in their first language. However, reflections from Participant 2 show that the language barrier is not exclusive to African learners. Learners of other races may have

problems understanding English if it is not their first language. This suggests that ensuring inclusive and effective teaching is challenging in multicultural or linguistically diverse schools since many teachers cannot code-switch between different languages.

However, participants 1 and 4 shared different reflections regarding cultural factors in teaching. Seemingly, these participants believed that cultural differences might come into play during teaching not necessarily through race and language but through life experiences. As such, they recommended that teachers should integrate learner life experiences in their teaching to make teaching effective and inclusive. This is evident in the following reflections they provided when reflecting on the cultural aspect of accessibility. They stated that:

> *"…I know that we're teaching in a multicultural set up, we have learners from diverse backgrounds…So, we must consider that when we're teaching…because when we are talking about a particular concept, some learners may be familiar with that concept while others may not be familiar with that concept…for example…when we're teaching subsistence farming, you give them topographical maps about the concept of subsistence farmers. You've got learners who are living in an urban area, who are totally unfamiliar what rural areas look like…so when you talk about subsistence farming, many learners may have not encountered subsistence farming. They may be familiar with commercial farming but haven't seen a subsistence farm…so you've got to take all of that into account…" (Participant 1).*

> *"In our school, learners come from various different backgrounds. But since it's a smaller class. I have a class of 25. It becomes easy to know…who comes from rural areas, who comes from townships, who comes from suburb. So, when I make examples, I try to pick examples from all three contexts so that no one feels inferior…" (Participant 4).*

The reflections from Participants 1 and 4 suggest that they paid attention to learners' immediate experiences when teaching. These participants seemed to believe learners learn easily when they can relate what is being taught to their personal experiences. As a result, they incorporated all learners' lifeworlds in their teaching to ensure inclusive and effective teaching. A study conducted by Athiemoolam and Vermaak (2021) to explore the integration of rural learners in urban schools confirms that learner participation increased significantly when teachers integrated learners' experiences into their teaching. Hence, Sleeter (2013)

contends that teachers should invest in getting to know their learners and adapt their teaching in light of learners' experiences. This shows recognition and acceptance of cultural differences in the classroom and improves teacher-learner relationships (Mashau, 2012). This suggests that teachers ought to decolonise the content of topography to make it sensitive to learners' experiences for effective teaching to occur. Thus, teachers should research what topography features (such as mountains, mesas, buttes, and gorges) are called in learners' languages to evoke their interest in topography. Reflections from Participant 4 suggest that this is much easier to achieve in a smaller classroom setting. This implies that larger class sizes may hamper inclusive education, especially in multicultural contexts.

In addition to the above, participants' reflections in the reflective activity indicated physical factors, as most participants mentioned that they had maps which they used to teach topography. This suggests that the participants were reflecting from the technical level in the questionnaires. Van Manen (1977) argue that technical reflections are concerned with the question of 'how a particular content is to be taught'. This suggests that participants understood that effective teaching of topography relied on the availability of topographic maps. However, in the interviews, participants' reflections had expanded as they were able to reflect on physical and cultural factors. Some had challenges in accessing their schools, while others had easy access to the schools (technical reflection). In terms of cultural aspects, all participants were able to reflect on the cultural issues that affected their teaching of topography (critical reflection). This suggests that in the second phase of data generation, participants were able to reflect from technical and critical levels. Van Manen (1977) as well as Taggart and Wilson (2005), argue that critical reflections are concerned with how education promotes equity, justice, and inclusion. However, it should be noted that some teachers were able to identify cultural differences that impacted their teaching but could not transform their teaching approaches to accommodate learner differences. Hence, Soodmand Afshar and Farahani (2018) argue that critically reflecting upon one's practice alone is not enough. Teachers take the responsibility of adapting their approach to ensure the injustices and inequalities within or outside the classroom are addressed. Thus, teachers should challenge themselves to translate topographic concepts to other languages in order to accommodate learners who may not be able to decipher such concepts when presented in English.

Moreover, in reflecting on accessibility, participants reflections indicated physical factors only as the challenges that impeded their teaching of topography. However, in the second phase of reflection, participants were able to reflect on cultural factors that impacted how topography curriculum was delivered and received by learners. This suggests that reflection is not a fixed concept, but it intensifies as teachers engage on it. Thus, although participants did not reflect on financial issues in education (which would signal practical reflection), the more they tried to reflect on the issues of accessibility, they would eventually develop awareness of financial issues. Darling-Hammond et al. (2007) concur that teachers who continually reflect on their teaching can learn from their past experiences and improve their future teaching. As such, Demirkasımoğlu (2010) contends that there is a strong correlation between reflective practice and teacher professionalism. This suggests that teachers who continually reflect on their practice are more likely to develop new teaching skills and improve their teaching. Thus, reflective teachers are continuously improving their practice.

5.2.3 Which goals (objectives, aims and outcomes) are you teaching topography towards?

Theme 3: Teaching goals

Participants' reflections on teaching goals in the questionnaires and interviews indicated that they reflected from the learning outcomes category as they focused on learners' intentions rather than teachers'. This suggests that teachers were not aware of the differences between teaching objectives, aims, and outcomes. Some participants indicated that they did not communicate the teaching objectives to learners. This suggests that these participants were using objectives as personal yardsticks to measure their lesson progression. This is evident in the following accounts:

> *"What I do is if I'm having a lesson on gradients, I'll just put up the formula, tell them this is why we're doing gradients…So I think the objectives are more in my head like I know what I'm doing and that's what I want to give to them" (Participant 3).*

> *"…Not all the time because the problem is that it's not given much attention in terms of time…Generally, I would know the objectives that learners should be able to do this and that but then I also have to check the time I have in terms of what needs to be*

covered and when…so, the focus is not on the skills, the focus is on whether can I teach calculations and interpretations in this whole week before I start another section…" (Participant 4).

The above reflections from participants 3 and 4 suggest that they did not communicate the teaching objectives to learners. Instead, they used teaching objectives as metrics to measure the progression of their teaching or syllabus. However, in the reflective activity, Participant 3 was able to reflect on objectives by explaining that she intended to make learners understand the differences between natural and human-made features. Contrary, Participant 4 reflections on the questionnaire (reflective activity) demonstrated learning objectives. She wanted her learners to be able to analyse and interpret topographical maps. This suggests that these participants were aware of topography's teaching objectives and learning outcomes but did not see the need to communicate them to learners. Reed (2012) argues that it is important for teachers to communicate the teaching objectives as this helps learners evaluate their own learning and see the value of doing activities. Objectives also help teachers evaluate the effectiveness of their teaching (Khoza, 2015b). Participants' reflections suggest that they were less concentrated on teaching objectives and more concentrated on syllabus coverage due to the limited time designated for topography teaching. This is evident in the reflection of Participant 4, who explained that sometimes she deviated from objectives to cover the syllabus. Ahiaku et al. (2019) concur that topography is underplayed in the geography curriculum as it is given less time and contributes fewer marks towards final exams. This suggests that the prescriptive nature of the CAPS curriculum may influence how teachers teach.

However, reflections from participants 1 and 2 provided detailed descriptions of their teaching objectives in teaching topography. Though both participants called them 'teaching objectives', the way they were structured suggested learning outcomes as they specified learners' intentions rather than teachers' intentions. This is evident in the following examples:

"…they should be able to take map skills they've learned in one map and apply them to any topographical map. So, they should be able to take all the skills and all those mapwork calculations, they should be able to perform that on a topographical map. Not just one, any topographical map but on variety of topographical maps…" (Participant 1).

"…that is part of our lesson planning. So, when we are doing our lesson planning, for example, say I want to teach the learners about direction, and I am teaching them using the topographic maps. By the end of the lesson, my learners must be able to tell me North, South, East, and West. They must be able to look at the map, look at the specific spaces on the map and tell me in which direction they have to go to go to that place…when we get our annual teaching plan that gives us information on what need to be covered within that term…So, based on what topics need to be covered within that term and the prescribed textbooks…looking at that…and my learners, that's how I am able to my short-term and long-term goals" (Participant 2).

The above reflections from participants 1 and 2 indicate that they were not aware of the differences between objectives, aims and outcomes. For example, participant 2 spoke of long-term (aims) and short-term (objectives) goals, but her reflections only indicated teaching objectives, while Participant 1 reflected on objectives as learning outcomes. Similarly, in the reflective activity, Participant 1 listed three statements indicating at least two categories of teaching goals but did not specify which category each statement represented. Contrary, Participant 2 explained that she was teaching to help learners learn how to interpret maps and understand man-made and natural features of maps. However, she also did not indicate whether these statements were objectives, aims or learning outcomes. This suggests that participants were not aware of how these concepts (objectives, aims and outcomes) differ. According to Donnelly and Fitzmaurice (2005), objectives are specific statements indicating teachers' intentions for teaching, while aims are general statements indicating also indicating teachers' intentions for teaching. However, learning outcomes indicate the end goal of teaching – the skills learners are expected to know and demonstrate (Donelly & Fitzmaurice, 2005). Moon (2002) argues that effective teaching occurs when teaching is driven by learning outcomes rather than objectives or aims. This suggests that despite participants' lack of knowledge of differences between objectives, aims and outcomes, they might have been able to teach topography effectively as they were aware of its learning outcomes.

Furthermore, based on the reflections participants provided, it seemed they were not aware that objectives, aims, and outcomes are provided in the CAPS curriculum, as none of them mentioned where they obtained the outcomes they used to guide their teaching. Only Participant 2 was able to articulate that she formulated the learning outcomes by looking at

the prescribed curriculum plan (ATP and textbooks) to work out what learner skills she had to teach. Khoza (2015b, p. 190) argue that "in terms of CAPS, aims, objectives and outcomes are included in the document, but they are presented as aims, specific aims and skills" respectively. This means that teaching aims are presented as curriculum aims, the objectives as specific aims, and outcomes as expected learner skills. This suggests that the curriculum structure of the CAPS document may be challenging for teachers to decipher, leading to their flawed understanding of the teaching goals. Du Plessis and Marais (2015) argue that the CAPS curriculum document is difficult for some teachers to understand because many teachers were not adequately trained to implement this curriculum. Hence, it is evident in this study that participants could not differentiate between the curriculum aims, objectives and outcomes.

In addition to the above, participants' ability to reflect on learning outcomes of the topography curriculum suggests that they were reflecting from the critical level of reflection. This implies that participants were able to decipher the prescribed content knowledge and determine the skills they had to teach (Taggart & Wilson, 2005). However, most of the teachers failed to reflect upon objectives and aims, which would denote technical and practical reflection, respectively. This suggests that the lower levels of reflection are not a prerequisite for the higher level of reflection, but reflection levels occur independently. Hence, participants were able to reflect upon their teaching goals (learning outcomes) critically despite failing to reflect on objectives (technical reflection) and aims (practical reflection). In other words, their topography teaching was driven by the learning outcomes. Thus, teachers taught topographic skills that learners needed to master or acquire.

Furthermore, the findings of this study indicate that were able to reflect critically as their reflections were focused on learning outcomes of topography. This suggests that the process of reflection is not linear, where teachers are expected to reflect from the first level of reflection until the last level of reflection. Thus, teachers may engage in reflections in whichever way depending on their understanding of the issues that affect their teaching. Kolb (2014) argues that reflection is a continuous process whereby the end of the cycle becomes the starting point of a new cycle of reflection. Though this argument does not explain participants' ability to reflect from the highest level of reflection (critical reflection), it does

highlight the complexity of the reflection process. Thus, teachers may use a top-down (critical-technical level) or bottom-up approach (technical-critical level) in their reflections.

5.2.4 What content are you teaching in topography?

Theme 4: Content

In the reflective activity, half of the participants were able to reflect on the mapwork topics they covered when teaching topography. Reflections from the other two participants indicated that they also integrated theoretical concepts of geography when teaching topography. During the interview, reflections from all participants indicated that they taught mapwork topics and covered the theoretical part of geography in topography teaching. This suggests that all participants had become aware of the interdependence between theory and mapwork during the interviews. This is evident in the following reflections:

> *"…there's three aspects which are in common from grade 10 to 12 – map skills and calculations…those are the aspects that we're teaching…you've got direction, true bearing, gradient, magnetic declination, magnetic bearing, you've got vertical exaggeration there, you've got your co-ordinates or your grid-reference…those are all the skills we're teaching…map code, map reference…those all fall under that aspect of map skills and calculations…and the third aspect is GIS or geographic information systems. And then lastly, we also teaching the integration of theoretical aspect from the grade 10, 11, and 12 to the topographical map…" (Participant 1).*
>
> *"…mapwork for us is more practical. So, you would teach them how to read a map…you would also teach them to determine which place is represented on the map, the map title and everything. So, it's mainly calculations and interpretations of the map…it basically includes everything because even climate is incorporated in map – we look at rainfall, we look at commercial farming which is economic geography. In other words, the theory components relate to mapwork…" (Participant 4).*

The above reflections from participants 1 and 4 suggest that they taught mapwork topics (such as map skills and calculations) as well as theoretical components when teaching topography. This suggests that participants were aware of the interdependence between the theoretical part of geography and map work, which Bednarz et al. (2006, p. 3) articulated by stating that "maps are not the whole of geography, but there can be no geography without

them". Hence, in the reflective activity, Participant 1 explained that he used maps to bring about integrated learning, where he shows learners how the knowledge of climatology, geomorphology, settlement geography, and economic geography could be applied to interpret and understand maps. Participant 4 agreed with these reflections in the reflective activity as she explained that she used mapwork to show learners how geography theories apply in real-life situations. This suggests that participants infused theory to foster analytical and interpretive skills to help learners visualise how maps relate to reality. The ability to analyse and interpret maps, graphs, and diagrams to decipher information about distance, orientation, distribution and association and come to conclusions or certain reasoning is referred to as spatial thinking (Lee & Bednarz, 2012). Collins (2018) argues that this is an important skill in geography as geographers gather information by studying natural and man-made features and their interactions. The geography CAPS document recommends that teachers conduct fieldwork when teaching mapwork so learners can interact with the physical world. Putra et al. (2021) argue that fieldwork provides better opportunities for spatial thinking development. However, the above participants did not mention anything about conducting fieldwork in their reflections. This suggests that participants explained topography instead of showing learners what it is. Thus, they did not expose learners to real-life experiences where learners can make connections between the real-world topography and map representation of topography.

Furthermore, Participants 2 and 3 agreed with the above reflections and further stated that the integration of theory in mapwork teaching is mandated by the DBE. This is evident in the reflections they provided as follows:

> *"With the topographic map, we do direction, we do gradient in terms of height, we do magnetic declination where we are pulling out information from the map, we even work with places – how to identify if that is a rural area or an urban area, whether there is primary activities taking place or secondary activities. So, we bring in settlement geography, economic geography, aside from just map skills in terms of calculations and GIS. We also bring climatology – where if it is an urban area, it's a hotter climate…In terms of our ATPs we have to make sure that if we're teaching climatology for term one, we have to incorporate climatology in mapwork. It has to be*

like that. If I am teaching geomorphology in term two, I have to incorporate geomorphology in mapwork…" (Participant 2).

"In grade 12 we cover climatology. In climatology there's winds that moves up and down the valley like anabatic, katabatic – valley winds. Those things they apply to the map…geomorphology as well is map-based…Geomorphology is the study of the land. They look at the river systems, the patterns of the river, how it's flowing, what the river type is? The water flow, turbulence. They must look at the steepness of the land to see if the water is flowing turbulent or laminar…fluvial landforms. You can see different types of landforms on the map…the theory has to be incorporated because, during a recent geography workshop, it was mentioned that it makes perfect sense to infuse mapwork if you are teaching climtology or geomorphology…" (Participant 3).

The above reflections from Participants 2 and 3 indicate that they were also facilitating integrated learning with topography, where they taught maps skills and calculations and incorporated the theory part of geography as Participants 1 and 2 did. The above participants had initially reflected differently in the reflective activity. Participant 3 mentioned only map skills and calculations as the content she taught in topography. In contrast, Participant 2 stated that there were various theory sections that could be taught using topographic maps and gave settlement geography and geomorphology as examples. However, during the interview, they reflected similarly. Their interview reflections indicated they also integrated the theory content of geography when teaching topography. Evidently, this is recommended by the department through policy documents like ATPs and in departmental meetings. In the geography CAPS document, the mapwork component is not a standalone knowledge strand but is spread out across all four knowledge strands of the geography subject (Department of Basic Education, 2011). Ahiaku et al. (2019) concur that mapwork plays a supporting role in the four knowledge strands of geography. Hence, mapwork is taught throughout the year (Department of Basic Education, 2011). This suggests that for all concepts teachers teach in geography, they ought to show learners how that concept relates to topography. For instance, when teaching geomorphology, they need to show learners how physical features are represented on the map and how they appear in real-life. This suggests that topography serves as the practical component of the geography subject, as Participant 4 had suggested. However, Participants 2 and 3 also did not mention anything about field work. This suggests that departmental workshops are needed to educate teachers now how topography is to be taught for effective implementation of the geography curriculum.

In addition to the above, in the reflective activity, half of the participants were able to reflect on the topics (such as map skills, calculations, and GIS) they taught in topography, while the other half was able to reflect on the content knowledge that could be integrated into topography teaching (climatology, geomorphology, economic geography, and settlement geography). This suggests that half of the participants reflected from the technical level while the other half reflected from the technical and critical level. However, in the interviews, all participants were able to reflect from the technical and critical level as they all mentioned map skills, calculations, GIS and theoretical aspects of geography as the content they teach in topography. Hoadley and Jansen (2013) and Shulman (1987) argue that teachers should possess sufficient subject knowledge to be able to teach effectively. Teachers' technical and critical reflections indicate that they were aware of the topics and theories that serve as the content of topography. This suggests that teachers had engaged with the intended curriculum to understand what to teach in topography. However, teachers failed to reflect on fieldwork, which would indicate practical reflections. This suggests that teachers' approaches to teaching topography were flawed and did not align with the intended curriculum. Hence, Shulman (1987) argues that teachers should familiarise themselves with content knowledge as well as pedagogical knowledge. This suggests that teachers were more focused on 'what to teach' than 'how to teach it'. As a result, their teaching of topography was theory-based instead of practical.

Furthermore, findings of this study show that participants initially possessed varying reflection abilities. While some were able to reflect from the critical level in the reflective activity, others only become aware of critical reflection in the second phase of reflection. Thus, during the interviews all participants were able to reflect critically upon the content of topography. As a result, they were able to make connections between the theoretical part of geography and topography. This suggests that critical reflection may prompt teachers to reflect upon the intended curriculum and interpret it according to their understanding and experiences. Khoza (2018) argues that is important for teachers to reflect critically upon the curriculum to ensure their interpretations of the curriculum, which get implemented during teaching and learning, are not distinctly different from the intended curriculum. Thus,

geography teachers who are unable to reflect critically upon the subject content may fail to assist learners in drawing connections between topography and theory.

5.2.5 What teaching activities do you use to teach topography?

Theme 5: Teaching activities

Participants' reflections on teaching activities indicated that all participants were using informal activities (worksheets, classwork, and homework) to teach topography. Though these informal activities were administered differently, depending on each teacher's style of teaching maps, reflections demonstrated that many of the participants relied mostly on conceptual teaching when teaching topography. This is evident in the following reflections:

> *"I start with conceptual teaching. I would teach mapwork the way I would teach theory…generally, I use a chalkboard. Explain to them what a gradient is. The formula for gradient and how to calculate it. I would use an actual example using the chalkboard. I will show them how to calculate. Once that is done…I will have a set of worksheets for them…I look for examples from the past year exam papers…" (Participant 1).*

> *"I will teach them how to do area on the board. I am going to draw the so called map as an example, certain blocks…and the I take the same thing and apply to the map and I get them to do it. So I do it on the board…he has a map, he has a calculation. Calculate the area between of the demarcated area in the topographic map. I give them that and they do it on their own." (Participant 2).*

> *"It would be worksheet at times and then I do classwork where we just do it together, question by question, especially if we're starting a new topic. And if it's something I've already taught maybe in two lessons then I give them a homework…" (Participant 4).*

Reflections from the above participants suggest that they used informal activities to teach topography. Participants carried the informal activities on the chalkboard together with learners to give them a basic understanding of the concepts they were teaching. In the reflective activity, these participants indicated they used informal activities to teach topography. Participant 2 explained that she assigned group work, peer assessment and

corrections on the board by learners. Participant 4 assigned classwork and homework using worksheets and textbook activities. However, aside from textbook activities and teacher-generated worksheets, Participant 1 also used past year grade 12 exam papers for revision. This suggests that these participants strongly relied on informal activities to teach topography. Chou (2011) argues that teaching activities are used by teachers to develop certain learner skills. The informal activities foster competencies, while the formal activities are administered to assess learner competencies (Kyndt et al., 2016). This suggests that informal activities are used by teachers to prepare learners for formal activities. Thus, participants used informal activities to check learners' understanding of topography.

However, Participant 3 shared reflections that were different from that of the other participants. She explained that:

> *"Aside from designing the worksheets and activities…I will pull certain things that are necessary. That I know will be tested and make them answer those things. So that's one way to break the map down but at the end of it I will do corrections and stuff…I use the past year exam papers. I will take over the last three years, maybe look at it, see the questions and that's how I set the task…" (Participant 3).*

Reflections from Participant 3 suggest that her focus was mainly on the formal activities. Although Participant 3 also relied on informal teaching activities to teach topography, her activities were designed in accordance with topography aspects that are usually tested in examinations. This suggests that the participant used informal activities to prepare learners for summative assessments. However, these reflections collude with the reflections she shared in the reflective activity. In the reflective activity, she explained that she used prescribed activities from the geography textbooks. The CAPS curriculum recommends that teachers shoud use informal, formal, and continuous teaching activities whenn teaching topography (Department of Basic Education, 2011). However, the policy is silent on the informal activities teachers should use to teach topography. Hence, the variations in Participant 3's reflections in the reflective activity and interview. The informal teaching activities used by other participants also differed to some extent. This suggests that the teaching of topography is not uniform across schools. Teachers use whichever teaching activities they prefer. Jansen (2001) contends that the intended curriculum is fixated on the idea that teachers similarly implement the curriculum by adopting the assumed teacher image

upon which the curriculum is designed. The findings of this study refute this assumption, as teachers used different teaching activities to teach topography. Earlier work by Carl (2005) confirms that teachers interpret and implement the curriculum differently. Some teachers may choose to teach topography using informal activities. Others may use formal and continuous activities or vice versa.

Furthermore, participants were able to reflect on the informal teaching activities they used to teach topography. This denotes that participants were reflecting on the technical level of reflection. As a result, they seemed aware that informal activities foster learner competencies (Chou, 2011). This implies that although participants did not reflect on formal activities they used to assess learners (which would have signalled practical reflection), they were aware that learners had to be prepared for formal assessment. Yambi (2018) defines formal assessment as a form of assessment used mainly to grade or promote learners to the next grade. Learners are assessed formally at the end of every term (Department of Basic Education, 2011). Thus, teachers used informal activities to prepare learners for these formal assessments. Amongst these assessments, there are continuous assessments administered in the form of project assignments. However, none of the participants reflected on the project assignment activities. This suggests that participants overlooked continuous activities when teaching topography. As such, none of the participants reflected on teaching activities from the critical level of reflection. This suggests that teachers' teaching of topography was strictly confined to classroom setting. Learners were not assigned activities where they had to go out and interact with the world to understand its topography.

Additionally, participants reflected the same way in the reflective activity and interviews regarding teaching activities. Their reflections indicated that they used informal activities to teach topography. This suggests that there was no expansion in their reflections. They reflected from the technical level of reflection during both phases of reflection. Thus, they were confident in their teaching practices. Valli (1997) argues that reflections prompt teachers to adjust and re-adjust their teaching approaches based on the teaching outcomes of the curriculum. However, the findings of this study show that this may not always be the case. Instead, the level from which teachers are reflecting and how entrenched is their teaching practices in their teaching philosophies may influence the decisions they take after reflecting

upon their practice. Hence, the study conducted by Donyaie and Afshar (2019) notes that some teachers who engage in reflection can identify problems in their teaching but do nothing to combat those problems. This suggests some teachers may view learners' difficulties to be intrinsic and require no adjustment of teaching approach.

5.2.6 How are they facilitating the teaching of topography?

Theme 6: Teacher role

Participants shared diverse reflections in reflecting on the teacher role. Reflections from most participants indicated that they used a learner-centred approach when teaching topography, while others used a blended or teacher-centred approach. This is well articulated in the following reflections:

> *"Learner-centred approach. I like to know what is going on with the learner. Majority of the time as I say you're a teacher, you're here to teach. You can't just stand in the front and teach, teach, teach, teach and just assume learners know what's happening. So I prefer the learner-centred approach because it gives me an idea. I am teaching this concept, does my child in the class really understand that concept? So let me bring them in and involve them in the content. By asking them, by giving them an example, by asking them to think out of the box…" (Participant 2).*

> *"…the function of a teacher is to facilitate learning. The days are gone where it's just chalk and talk and you present all the information to them because at the end of it all, learners must be able to interpret the map. They must be able to analyse the map. So the role of a teacher, the way I see it, will be to facilitate that understanding of the topographical map, the analysis and interpretation of the map. That is what the function of the teacher is with the map…" (Participant 1).*

Reflections from Participants 2 and 1 suggest that they facilitated learner-centred lessons. This implies that these participants assumed facilitator roles (learner-centred) rather than instructor (teacher-centred) or assessor roles (content-centred). Coetzee (2009) argues that teachers who assume the role of a facilitator design learning experiences where learners are given opportunities to construct and contribute to the body of knowledge. However, reflections of these participants in the reflective activity seem to suggest that they assumed instructor roles when teaching topography (implemented teacher-centred lessons). In the

reflective activity, the participants explained that they first provided information to learners to help them understand the topography and then assigned activities to assess learners' retention of that information. This suggests that there were disconnects between what teachers implemented when teaching and how they perceived their curriculum implementation. These findings are in confirmation with the earlier work of Naxweka and Wilmot (2019), who explored the teaching of mapwork in Namibia using interviews and observations. This study notes that geography teachers claimed to prioritise learner participation, contribution, or involvement during interviews. However, the majority of the teachers adopted a teacher-centred approach when they were observed. Buehl and Beck (2015) contend that teachers' beliefs about teaching are sometimes not congruent with their practices. This suggests that the espoused beliefs of geography teachers about teaching topography may not necessarily be what they implement.

Nevertheless, Participant 3 shared reflections that were different from that of Participants 2 and 1. According to Participant 3:

> *"I think the goal is to get that information to all of them. But then obviously class size is an issue, 45, and you're standing in the front. It's difficult. You lose them. Sometimes you just lose them as you get a bunch of naughty fellows in the back. They will create chaos and that will become like a disease to everyone in the class. So sometimes I feel like I'm trying to explain one thing over and over, but learners are lost…So the only way to get through that is to tell them step by step what to do. Go and do this now I'm standing and I'm just walking around and checking that if that's what they're doing. And in the end, answers are up, then they must check if they got it and I ask them to raise their hands if they have got a correct answer…" (Participant 3).*

Reflections from Participant 3 suggest that she assumed an instructor role when teaching topography. She believed her role as a geography teacher was to provide information to learners. Thus, her lessons were teacher-centred. Hoadley and Jansen (2013), as well as Khoza (2015b), define the instructor role as a teaching approach where the teacher is the sole provider of information and dictates the lesson. These reflections corroborated with the reflections she provided in the reflective activity, where she explained she used a chalkboard to teach topography. This suggests that the participant prioritised knowledge retention rather

than knowledge construction. As such, her lessons were structured around teaching and assessing learners' knowledge gaps. However, she struggled to maintain learners' discipline and concentration. Al-Zu'be (2013) argues that learners may feel disinterested in learning if they are not actively involved in teaching and learning. This suggests that teaching topography as a foreign concept to learners may result in poor reception of knowledge.

However, Participant 4 shared interesting reflections reflecting on the teacher role. Her reflections indicated that she has moved beyond the instructor or facilitator dichotomy to taking advantage of both teacher roles in teaching. This is evident in her reflections below:

> *"I think there's two. The first one is to somehow get information from the learners on what they know. And then the role of giving them information. But the important role is to facilitate learning, with less emphasis on merely providing learners with information…mapwork is mostly skills based than acquiring knowledge. So you facilitate the learning process. You give activities. There's less time for you to talk. It's more time of learners doing things. So when you tell them let's do magnetic declination. This is how you calculate magnetic declination. I just do one calculation as an example. Then I give them different years in which they need to calculate magnetic declination. Then I walk around to check to see who understand and who needs help. What's are they missing and so on." (Participant 4).*

Participant 4 reflections suggest that she assumed a blended or mixed teacher role where she infused both instructor and facilitator roles. This suggests that she implemented lessons that were teacher-centred at the initial stage and slowly reduced her involvement as the lesson progressed to allow for independent learning. The participant shared similar reflections in the reflective activity. She explained that she allowed her learners to share prior knowledge before eliciting responses. This suggests that though she arguably possessed deep subject knowledge on topography, she was able to allow her learners to share their experiences and views about topography so she could identify and correct their misconceptions. The earlier work by Coetzee (2009) confirms these findings as it notes that it is much easier to identify learners' misunderstandings and challenges when the lesson is learner-centred than when it is teacher-centred. This is because the learner-centred approach prioritises constructing meanings rather than memorising facts (Hoadley & Jansen, 2013). This suggests that teachers

who teach topography using learner-centred approaches are more likely to implement topography teaching effectively than teachers who use teacher-centred approaches.

In addition to the above, participants were able to reflect on teacher-centred and learner-centred approaches. This suggests that they were reflecting from the technical (teacher-centred) and practical (learner-centred) levels of reflection. None of the participants reflected on a content-centred approach (which would signal critical reflection). This suggests that participants could not think beyond their preferred approaches of teaching and why they were teaching topography content. Hoadley and Jansen (2013) and Khoza (2015b) argue that the content-centred approach is used by teachers who assume the role of an assessor when teaching and privileges the prescribed content knowledge over anything. Such teachers are driven by the curriculum prescriptions. The findings of this study highlight that there are disconnects between participants' beliefs about their teaching and their practices. This suggests that participants were not critical of their beliefs and practices. As a result, they could not identify gaps in their ideas about teaching topography and how they taught it.

Additionally, the findings of this study suggest that participants' reflections differed from their actions. This suggests that teacher perspective may be a challenge in reflections as teachers may not be able to reflect upon their practice from different viewpoints. This suggests that a teacher may believe they're implementing a learner-centred lesson while the lesson is viewed as teacher-centred by learners. Hence, Valli (1997) argues that teachers need to consider not only inner voices when reflecting, but also the perspectives of other teachers and research. This suggests that for teachers to be remotely sure of their practice, they should not only reflect upon their practice but allow their colleagues to criticise their practice or share points of view regarding their practice.

5.2.7 What resources are they using to teach topography?

Theme 7: Teaching resources

Participants' reflections on teaching resources suggest that they were all able to reflect on hardware and software resources they used when teaching topography. However, the majority

of the participants were not aware of ideological ware resources. Participants' reflections suggested that there were limited hardware and software resources to support their teaching. This suggests that participants were restricted in teaching topography. This is evident in the reflections shared by Participant 3 when she stated that:

> *"Textbooks. I make them buy study guides but not all can afford it. Some got but some don't have. I run out and get some worksheets for those that don't have. But it's a task again. So we're using textbooks…when they write their final matric exams…the Department sends us maps. So we keep them. But then the issue is if there is 25 writing in the previous year and then this year grade 11 is 45 then you're automatically short on maps in the next year and then it's difficult to get maps…if learners paid school fees then they get a stationery package…there's a map set. There's protractor in it…There is one computer but at times, there's too many teachers using it so it becomes difficult for us to move around like that. But we can try and make a plan. But it is an issue because sometimes too many people want to use it at the same time…" (Participant 3).*

The reflections from Participant 3 suggest that she relied on hardware resources (such as worksheets, textbooks, maps, map sets, and computers) when teaching topography. However, her reflections indicated that these resources were not always available due to the limited number of maps, learners' inability to afford stationery and the shortage of resources in the school. In the reflective activity, the participant mentioned that she used maps and chalkboards to teach topography. This suggests she primarily relied on hardware resources to communicate the curriculum to learners. Evidently, Participant 3 also had access to a computer, which could have prompted her to use software resources in her teaching. Seemingly, the limited access to the computer deterred her from designing computer-based teaching activities. As a result, she did not reflect on software resources and neglected ideological ware resources. Khoza (2013a) defines teaching resources as anything teachers use to deliver the subject content. As such, Thijs and Van Den Akker (2009) position teaching resources as an indispensable element of teaching, as it may be virtually impossible for teachers to communicate the curriculum to learners without them. This suggests that a shortage of teaching resources may affect the way teachers teach topography. Thus, teachers may be unable to teach topography effectively without the appropriate resources.

Participant 2 agreed with Participant 3 reflections by sharing the following reflections:

> *"Majority of the time it's all different orthophoto and topographic maps. And then its protractors, those big protractors and stuff when I'm teaching true bearing, the rulers, those resources…I've used a computer during the COVID times when I had less learners coming at a specific time and stuff. I was able to use it because I was able to plug it in and had sometime to fidget around it to gain working and stuff. But now on the daily basis with class of 44 it's impossible…but with enough time and preparation it can be done. Also, there are so many PowerPoint presentations and so many beautiful resources that are given to us that can be used when teaching geography. Only thing we need is data projector…" (Participant 2).*

Reflections from Participant 2 suggest that she also mainly relied on hardware resources when teaching topography. However, her reflections indicate that she had fairly good access to a computer as compared to Participant 3. Nevertheless, she did not use it to teach as she was not accustomed to teaching with it and felt it would be a challenge to use it in a bigger class. In the reflective activity, Participant 2 expounded that she used topographical maps to teach topography. These reflections further illuminate her inclination to use hardware resources when teaching topography. Seemingly, she also had access to software resources like PowerPoint presentations. However, she could not use these as the school had no hardware resources (data projectors) to support them. This suggests that software resources depend on hardware resources to function. Khoza (2013a) concurs that software resources cannot be used without hardware resources. Hardware resources refer to any tools or machines teachers use when teaching, while software resources refer to application programs teachers use to display data in hardware resources (Khoza, 2013a). Thus, PowerPoint is software, and the computer and projector used for displaying PowerPoint presentations is hardware resource. Dzansi and Amedzo (2014) argue that most South African schools have access to computers but do not have the necessary facilities and adept teachers to use them. This suggests that some schools have ICT resources, but teachers are not technology-savvy. As a result, their topography teaching depends on traditional teaching resources.

Nevertheless, Participant 1 shared reflections similar to those of Participants 3 and 2 but also demonstrated ideological ware awareness that these two participants failed to reflect on. According to Participant 1:

"...I use a chalkboard. That's one tool I use. That's very important. I think chalkboards are an important arsenal in any teacher's toolbox. Some are using PowerPoint. There's still the old method of chalk and talk. And chalkboard still works exceptionally…then I use worksheets extensively for mapwork. Especially, when doing calculations. I give them a range of worksheets that they have with them…the other resource that we use to teach except for worksheets, we use topographical maps…we got a range of orthophoto and topographical maps…they are supplied by the Department of Education. So normally, it's given to school for NSC examinations…we do not return them to the department. Then at our school we're using a prescribed textbook for grade 10 and 11 learners. This is school property. All learners have their copy of the textbook. The book has got theory and mapwork…" (Participant 1).

Participant 1 reflections suggest that he mostly used hardware resources as well. He was aware that software resources like PowerPoint could be used to teach topography. However, his reflections suggest he still preferred the chalkboard and complemented it with other hardware resources. In the reflective activity, he shared similar reflections by stating that he used mapwork worksheets designed by himself, topographical and orthophoto maps received from the department for NSC examinations, prescribed textbooks, and study guides. This suggests that his teaching of topography relied mostly on hardware resources. However, his reflections suggested that he also reflected on ideological resources, as he indicated that he particularly preferred to use worksheets for teaching mapwork. This suggests that for Participant 1, worksheets were more suitable for teaching topography than other hardware resources. Khoza (2015b) defines an ideological ware resource as a resource that cannot be seen or touched, such as teaching approaches and theories and the visions that underpin the selection of resources for teaching. As such, (Khoza, 2013a) views ideological ware as the key resource in teaching as it determines the hardware and software resources used by teachers in teaching. Thus, Participant 1 reasonings for using worksheets for mapwork were an ideological ware resource. This suggests that ideological ware may allow teachers to choose appropriate teaching resources (whether software or hardware) for teaching topography depending on their teaching objectives.

However, Participant 4 shared reflections that demonstrated all three types of resources. She was able to reflect on hardware, software, and ideological ware resources. This is evident in the following reflections:

> *"I have a globe. So I use a globe. Getting maps is not a challenge. We have lots of maps…we keep the ones we get from the Department for matric exams. They're not returned back so we use them…and protractors but we encourage learners to get 360-degrees protectors because learners are struggling with 180 when doing true bearing…and then it will be a ruler and pencil. And there's also this software that we use but the disadvantage is obviously that learners don't have computers, but I'd project it. The software is for GIS. It shows layers of information because that's another section I think as GIS teachers should pay more attention to because learners are struggling in the section of GIS. So we use a computer software to teach that part because GIS is more computer application. So to make it more interactive, we use the software…" (Participant 4).*

Reflections from Participant 4 suggest that she mainly used hardware resources when teaching topography. Seemingly, she had access to a software resource. However, she particularly used this software for GIS. This illuminates ideological ware resource as the participants was able to determine which hardware or software resource suited what content knowledge. Hence, she preferred 360-degree protractors for teaching true bearing. In the reflective activity, she explained that she used paper maps and textbooks when teaching topography. This suggests that she mostly relied on hardware resources to teach topography. Dzansi and Amedzo (2014) argue that although some schools may have ICT technologies, many teachers still rely on textbooks. Munje and Jita (2020) assert that ICT was poorly integrated in most township schools. This suggests that although some schools have ICT, it is not fully operational. Thus, teachers may not be able to integrate it into teaching all subject knowledge. Hence, Participant 4 could not use it for teaching topography. As a result, she ended up teaching topography in the traditional way.

In addition to the above, participants' reflections mainly indicated hardware resources, with some reflections indicating software and ideological ware resources. This suggests that participants largely reflected on resources from the technical level, with a few reflecting either from the practical level (software resources) or critical level (ideological ware

resources). Thus, participants were aware of the importance of teaching resources in teaching (Khoza, 2013a; Van den Akker et al., 2009). However, their reflections mainly focused on hardware resources (such as maps). This suggests that they were aware that their teaching of topography depended on the availability of paper maps (topographical and orthophoto).

Moreover, the findings of this study show that participants reflections were influenced by the availability of resources in their schools. Participants who had software resources were able to reflect from the practical level of reflection while those who did not have software resources in their schools were limited to reflecting either on hardware resources (technical level) or ideological ware resources (teacher's own visions) – critical level of reflection or both. This suggests that contextual factors may influence how teachers reflect upon their practice. Hence, Boud and Walker (1998) argue that the kind of resources that teachers have access to influence how they teach and reflect upon their practice. This suggests that teachers from under resourced schools may be limited to reflect from technical reflection as their teaching may largely depend on hardware resources like textbooks and chalkboards. On the other hand, teachers from resourced school may be able to reflect from practical and critical levels as they may have limitless access to teaching resources.

5.2.8 Where and when do you teach topography?

Theme 8: Location and Time

Participants' reflections on location (teaching environment) indicated that they mostly taught topography within the classroom environment. Some participants did facilitate outdoor teaching, but only on rare occasions. Others kept their topography teaching confined to specialised teaching environments (classrooms) due to various challenges associated with out-teaching. This is evident in the reflections provided by Participants 2 and 4.

> *"From the time I started teaching geography, I've always done it in the classroom. It has never been out of the classroom which is a failure on my side. Because it just means success is not guaranteed because geography is not confined to the classroom. Geography is out there. And if I want to do an exceptional job in teaching geography, I need to now become brave enough to take my children out there…the learners that we have are very diverse…so when we take them out, I have to take into consideration*

the number of learners in my class. And then when I do take them out, I have to have control over them 100%. So in order for me to do this, for me it's going to be trial and error. If I take them out and they misbehave, we're never going out again..." (Participant 2).

"It's mainly in class because the maps that we use do not relate to the area that we stay in. Unless if we see that there's few things that relate to our area, we then go and look at those things but most of the times I teach in the classroom" (Participant 4).

Reflections from the above participants suggest that they did not facilitate outdoor topography lessons despite knowing that fieldwork-based teaching is essential in geography. This indicates that the participant was aware that outdoor teaching could provide a real-world opportunity for learners to develop an understanding of topography. However, for Participant 2, the challenge was the class size and learner behaviour. On the contrary, Participant 4 was deterred by the lack of physical features relevant to topography in the school's surrounding environment. In the reflective activity, these participants shared reflections that were similar to how they reflected in the interviews. Participant 2 explained that she taught topography at her school, while Participant 4 expounded that she taught it in her classroom. This suggests that their topography lessons were delivered within the classroom environment. Bernstein (1975b) argues that it is common for teachers to facilitate their lessons within a specialised environment when delivering a performance curriculum. As previously stated in chapter two, the CAPS document is a performance curriculum characterised by a highly prescriptive nature (Khoza, 2015b). This suggests that teachers were implementing topography teaching following the structure of the CAPS policy. Hence, teachers knew the importance of fieldwork-based teaching in topography but did not implement it, as it was not structurally accommodated in the CAPS curriculum.

Nevertheless, reflections from Participants 3 and 1 indicated that they facilitated outdoor teaching despite its challenges. However, this was done occasionally, as evident in the following reflections these participants provided:

"It's nice to take them outside so they can see visually what's happening. How the roads look, the building structures, how the houses flow, and all the other parts. So I do take them outside but not too often. I think it was just term one, where one time I took them out and then when we came back in the classroom we talked about

identifying the street patterns and whether they were able to spot if the houses were nucleated or dispersed and if they recalled the different mountainous areas…but we do not go out too often because there is not enough time. And then behaviour. You take them outside and they go crazy. So in whatever they need controlled. The behaviour is a big problem and then attitude…" (Participant 3).

"…it's mainly been classroom based. We haven't been out. But there are times for example when you're teaching them slopes, and what the different types are, i.e. a steep slope, a gentle slope, a concave slope, a converse slope, a terrain slope. You take them around the school, and you show them what a steep slope looks like…they can identify them. You can teach the section on soil erosion, which is relevant to theory and mapwork as well. You can take them around the school, you identify areas where there is soil erosion…so there is some aspect that I do take them out but not every lesson. It's impossible to take them out every lesson. But most of the mapwork teaching is done in the classroom…" (Participant 1).

Reflections from the above participants suggest that they conducted outdoor teaching when they taught topography aspects that were relevant to the content. Thus, they took their learners out to give them real-life images of topography features they see on maps. However, this was done sporadically for varying reasons. For Participant 3, teaching outdoor teaching was time-consuming. Her reflections in the reflective activity confirm that she taught inside and outside the classroom. Similarly, Participant 1's reflections on the reflective activity suggest that his lessons were delivered within the classroom, but learners were also given homework activities. This suggests that these participants were of the view that learning occurs anywhere and is not limited to a classroom environment. According to Wang and Qi (2018), as well as Chen et al. (2014), teaching may occur outside the classroom, where teachers assign activities that learners would have to carry out on their own in their own time. This is referred to as flipped classroom teaching, which opposes the traditional way of teaching (Hung, 2015). This suggests that teachers can teach topography by assigning homework activities that would prompt learners to observe the topography of their communities. Thus, the school environment does not have to have all the topography features for teachers to be able to give learners real-life teaching and learning experiences.

In reflecting on location (teaching environment), participants also reflected on the time they teach topography. Although teaching location and teaching time are intricately intertwined, participants' reflections on these elements are provided separately as they provided detailed descriptions of how they proportionated teaching time for topography and geography theory. Participants' reflections indicated that they taught topography towards the end of every term. However, the time they proportionated to teaching topography varied between one to three weeks per term. This suggests that teachers had to devise their own strategies for teaching mapwork. This is evident in the reflections provided below:

> *"...generally, what I do in terms of teaching mapwork because you may look at it now, the department has also restructured the ratio of mapwork and theory. Previously, there was greater ratio of mapwork although theory was more. It was 70% to 30% mapwork. Now mapwork is only 20% of the curriculum and examination…so teachers can't spend more time on mapwork and neglect theory because then you have a problem…so this is the way I approach it…usually we teach mapwork every single term…so take term one for example, I will take 80% of the term teaching theory and 20% teaching mapwork. What I do is, I will take about three weeks, three consecutive weeks we're teaching theory and then stop and then leave it aside. And then I take about three consecutive weeks in each term and I only teach mapwork in that time…" (Participant 1).*

> *"...I usually teach mapwork after covering the theory. There is usually two weeks left then I'll do the mapwork in that time left. There is like two weeks after I finish theory, every term. Because I told you the theory becomes a lot to get through. So we try to just race, get through the theory because you know that's bulk up the marks. And then come to mapwork…" (Participant 3).*

The above reflections from Participants 1 and 3 indicated that they proportionated much of their teaching time to teaching theory and spent less time teaching topography. Participant 1 spent three consecutive weeks teaching topography in each term, while Participant 3 spent two weeks. This suggests that they prioritised theory more than topography. Hence, in the reflective activity, Participant 3 explained that she taught topography once she had finished the theory. Similarly, Participant 1 explained that they were bound to focus more on theory than topography because there is more theory to teach. In the CAPS document, mapwork is inserted towards the end of every term (Department of Basic Education, 2011) and given

fewer teaching hours than other knowledge strands. For this reason, mapwork is usually looked upon by teachers as it contributes fewer marks to the final examinations (Ahiaku et al., 2019). Hence, participants dedicated varying teaching times to mapwork. This suggests that although participants were guided by a ratio in terms of how much topography they were expected to teach, they also used their experience to determine how many weeks they needed to teach topography. This suggests that teachers' teaching of topography may not be uniform. Some teachers may spend less time than others in teaching topography.

However, Participant 2, who shared reflections that concurred with the reflections of the above participants to some extent, explained that:

> *"...every time I go for moderation I am learning something new, so I am trying something new. So I used to teach theory first. Cover theory, finish theory completely. With a week to spare, before exams, and that last week used to be for mapwork only. So recently, when I went for moderation, there was a teacher at that moderation that suggested I should incorporate mapwork in my theory lessons. So if I have a 55 minutes geography perioid, I must teach theory for 45 minutes and use the last 10 minutes to do just a little bit of mapwork every day. So that is what I am going to try from now on" (Participant 2).*

The above reflections from Participant 2 suggest she used a similar strategy to that of Participants 1 and 3. Thus, she taught topography on the last week of the term when she had covered the theory. It is worth noting that she did not rely on her teaching experience to determine how much time she needed to dedicate to teaching topography. She also enquired from other experienced geography teachers to find out what worked for them. As such, she was able to revise her teaching strategy for topography from one week every term to ten minutes of topography teaching every day. This suggests that for every geography concept she taught, she would show learners how it relates to topography. However, in the reflective activity, she shared reflections that corroborated her previous teaching time for topography. This suggests that her new teaching strategy was still in the testing phase. Valli (1997) argues that it is important for teachers to consult other teachers to gain different perspectives about their practice. This process is defined as deliberate reflection (Valli, 1997). Tseng and Kuo (2014) argue that knowledge sharing and receiving is important in teaching because it expands teachers' pedagogical knowledge (PK), enabling them to manage curriculum

implementation better. This suggests that geography teachers who communicate with their fellow geography teachers may have access to numerous ways of teaching topography. This may improve their pedagogical approach to teaching topography.

In addition to the above, participants were able to reflect on the teaching environment they use for teaching topography and the time. This suggests that they were reflecting from the technical and practical levels of reflections. As such, they were able to justify their reasonings for teaching either within the specialised environment or facilitating occasional outdoor lessons (technical reflection). Bernstein (1975b) argues that teachers should teach in contexts that are suitable for their subjects. This suggests that participants engaged in technical reflection to understand how their referred teaching environment affected their teaching of topography. As a result, some were able to indicate that they jeopardise the success of topography lessons by not taking learners to interact with physical features of the world. Participants were also able to indicate how they proportionated the time for teaching topography (practical reflection). Khoza (2013b) argues that one needs time to teach any subject regardless of the teaching environment. Hence, he views the teaching environment and time to be intricately intertwined. Participants were able to reflect on teaching time through practical reflections where they reflected on how they proportionated time for teaching topography against theory. Nonetheless, none of the participants were able to reflect on critical reflection. Mpungose (2015) contends that critical reflection regarding location and time involves the teachers' ability to design internet-based teaching where learners can learn independently.

Additionally, participants reflections indicated that they were aware that fieldwork-based teaching was necessary in teaching topography and the geography subject as whole. However, some participants neglected fieldwork while others were not enthusiastic about conducting fieldwork teaching due to the challenges it entails. This suggests that their reflections were not driven by open-mindedness, responsibility, and wholeheartedness. Dewey (1933) argues that these dispositions are the pillars of reflection. They propel teachers to reflect meaningfully and improve their practice. This suggests that although reflections allowed participants to identify suitable ways to teach topography, they did not have a strong desire to adapt their teaching due to the responsibility it required of them to conduct

fieldwork-based teaching. Thus, the effectiveness of the reflective practice or reflection lies in the three dispositions Dewey (1933) suggested.

5.2.9 How do they assess their learners?

Theme 9: Assessment

Participants' reflections on the assessment suggest that they used primarily informal assessment during teaching and conducted formal assessments for exams. Very few reflections indicated continuous assessment. This suggests that participants were mostly reflecting on technical and practical levels of reflections. This is evident in the reflections provided below.

> *"I think that the worksheets are one way and also I'd like to call them to put their answers on the board…I'll tell them this is the calculation and give them about five minutes to work it out…sometimes it's just informal worksheets and sometimes informal tests…in term one we do a mapwork formal test. And in term two, mapwork is tested in the June examination. In term three, mapwork is not tested with grade 10 and 11. And in term four, mapwork is tested in grade 10, 11 and 12 in the exams in the final examination for formalities" (Participant 3).*

> *"It would be through our activities, checking learners' homework activities to see if they have done them besides the classwork activities because that's more of a larger scale. When checking the activities I've given as homework, I check individually and if I see a learner is struggling...You'll find that it will be based on the assessment that appear in the ATP…the first term has a mapwork task. So it's the first term and second term as mapwork is tested also in the June examination and carries like 30 marks out of 150. And then mapwork is also tested at the end of the year. So in term three, there's no mapwork but at our school we do it" (Participant 4).*

> *"Mapwork is tested formally in the first term. Then you see it again in the June examination and you see it again in the trail and final exam…every time we do a calculation or I am teaching a calculation, I'm getting them to do at least three in their books. Just so they get familiar with it. That's a continuous assessment. It's not formal but it's work that's being done on a continuous basis so that I know they also know what they are doing…" (Participant 2).*

The above reflections suggest that participants mostly used informal (formative) assessments during teaching and learning to foster topographic skills and assess learners' development of these skills. They also administered formal (summative) assessments towards the end of the term as required by the department. This suggests that they used informal assessments to prepare learners for formal assessments administered for grading purposes. However, in the reflective activity, participants' reflections indicated only informal activities. They all explained that they assigned classwork and homework activities to evaluate learners' knowledge retention and determine if they needed more explanation. This suggests that participants conducted informal activities to assess their teaching of topography. Van den Akker et al. (2009) concur that assessment is essential for evaluating one's own teaching. Yambi (2018) contends that teachers may assess the efficacy and effectiveness of their teaching skills and approaches using formative assessment. Thus, formative assessment allows teachers to adjust and re-adjust their practice (McAlpine, 2002). This suggests that teachers who implement informal (formative) assessments when teaching topography may be able to identify shortcomings in their teaching approaches and use different strategies that suit topography teaching best.

However, Participant 1 shared reflections that slightly differed from the above reflections in the sense that he did not only reflect on informal and formal activities. But his reflections also indicated continuous assessment although he did not refer to it as such. According to Participant 1:

> *"…the first thing we look at is worksheets. We're giving them worksheets…we give them activities and they will answer these activities and we'll correct the work with them. So during the process of correcting the work, you can see whether learners understand…we also use the exercises from the prescribed textbook…Also, we give them a short informal class test if I have taught the concept on gradient. I then give them one question on gradient or vertical exaggeration and give them five minutes to quickly answer this question…then you get formal map tests. A formal map test is what is prescribed and what is required. It's a longer test and that mark is taken as part of the SBA or year mark. That mark is used for promotion purposes. Then you've got another way of assessing, you've got control tests. We've just written a March control test…You've got June examination. You've November examinations as*

well…so we are testing mapwork in those papers. Other ways of assessing is by giving oral questions during the lessons…" (Participant 1).

Participant 1's reflections suggest that he used informal (formative) assessments the same way other participants used them, which was to assess learners' progression in mastering topographic skills. Similarly, he also conducted formal (summative) assessments for grading his learners. In the reflective activity, he explained that he used a variety of informal assessment tasks to test his learners' skill development. This ranged from worksheets, exercises from the textbook, informal class tests, and oral questioning, as well as control tests for formal assessment. This suggests that he relied on informal assessments to foster topographic skills in learners. However, it is important to note that his reflections also suggested he inadvertently conducted continuous assessment as he was aware that the marks from control tests are converted to SBA (School-Based Assessment) or CASS (continuous assessment) for the final examination. According to Department of Basic Education (2011), the CASS mark in geography is 25%, calculated from control tests (Mar, Jun & Sept), and the final examination contributes 75. Shepherd and van der Berg (2015), who conducted a study comparing CASS data to matric final exam results (externally assessed), found a weak correlation between CASS and exam marks. This suggests that teachers should encourage their learners to do well in all their examinations regardless of how large their CASS mark is.

In addition to the above, participants mostly reflected on informal/formative and formal/summative assessments. This suggests that they were reflecting from the technical and practical levels of reflections. Thus, they were mostly worried about the effectiveness of their teaching in preparing learners for control examinations (summative assessment) (Yambi, 2018). In other words, participants conducted informal assessments to reflect on their practice to revise their teaching strategies or offer remedial support to struggling learners. However, the majority of the participants were silent on continuous assessment (CASS). This suggests that most participants were not aware that CASS is part of the assessment. Thus, they did not reflect critically and failed to consider continuous assessment and its importance in teaching and learning.

Moreover, findings of this study show that teachers' reflections can be influenced by assessment. Participants' reflections indicated that they conducted assessments, particularly

informal assessments, to examine the effectiveness of their teaching strategies and methods. This suggests that assessment may prompt teachers to reflect upon their teaching. Hence, Yambi (2018) argues that in giving feedback on assessments, teachers need to analyse learners' achievements according to their teaching objectives and outcomes to identify areas of weakness and provide necessary support. This suggests that teachers should engage in reflections to understand which areas they might have not taught sufficiently. Thus, there is a strong correlation between assessment and reflections.

5.3 Conclusion

This chapter (Chapter 5) has provided data presentation and discussion of findings. It began with a table showing all the themes adopted from the curricular spider web, the complimentary questions of the spider web, the categories from which teachers were expected to reflect as per each concept of the spider web, and the level of reflection associated with those categories (technical, practical, and critical reflection). The data generated was presented and discussed following the curricular spider web (CSW) concepts which were used as themes in this study. Participants' reflections on each CSW concept indicated which level were geography teachers reflecting from, addressing the first research question which sought to understand what are geography teachers' reflection on teaching topography. Participants shared varying levels of reflections across all nine CSW concepts. Participants' reflections on these concepts were induced by different factors that intertwined with their teaching of topography. These factors addressed the second research questions which sought to understand what informed geography teachers reflections on the teaching of topography. The third research question was adressed through the discussin of participants' reflections on the CSW concepts. However, a close scrutiny at the reflections participants iterated on each CSW concepts shows that some concepts addressed one of the research questions more than others. A sythesis of which CSW concept addressed which research question is provided in the following chapter (Chapter 6).

CHAPTER SIX

Summary, conclusions, and recommendations

6.1 Introduction

The study explored geography teachers' reflections on teaching topography. The study aimed to understand geography teachers' reflections, explain what informed their reflections, and understand the lessons that could be extrapolated from their reflections. As such, the study was guided by the following three research questions: what are geography teachers' reflections on teaching topography, what informs geography teachers' reflections, and what lessons can be learned from geography teachers' reflections on teaching topography? The previous chapter (Chapter 5) has presented and discussed data generated. Therefore, this chapter (Chapter 6) provides the summary of the findings and conclusions based on the research questions; (What are Geography teachers' reflections on teaching topography? What informs Geography teachers' reflections on the teaching of topography? What lessons can be learned from Geography teachers' reflections on the teaching of topography?). I also discuss recommendations for future research.

6.2.1 What are geography teachers' reflections on teaching topography?

Participants' reflections on the teaching rationale reveal that teachers have limited power in deciding what is taught, when and how. Instead, they should strictly follow the curriculum prescriptions of the CAPS policy when teaching topography. Thus, their teaching of topography is mainly centred on fulfilling their professional duities and responsibilies as geography teachers and meeting the aims and objectives of the intended curriculum which they are hired to implemement. In other words, the teaching of topography require little of their contribution regarding how it is taught and when it is taught. This suppresses teachers'creativity in communicating the topography content to learners and impell them to adopt a one-size-fit-all approach when implementing topography lessons. As a result, they fail to make the topography content sensitive to learners needs.

Additionally, participants' reflections on the teaching goals (aims, objectives and outcomes) revealed that teachers concentrate on the prescribed learner skills (learning outcomes) that

learners should demonstrate at the end of topography teaching. This furtther illuminates the suppresssion of teachers in decision-making regarding the implementation of topography curriculum. Participants had to teach topography according to the predetermined standards of the intended curriculum (expected learner skills). However, geography teachers present learning outcomes as teaching objectives. They overlook the teaching aims and objectives which respectively influence the learning outcomes which they prioritise when teaching topography. Thus, teachers did not understand how the learning outcomes of topography came into being nor do they understand the differences between the teaching aims, objectives and outcomes. Participants reflections also show that some teachers do not communicate the teaching objectives to learners. Instead, they view the teaching objectives as predetermined teaching standards meant to guide teachers in their implementation of the topopography curriculum. Thus, the restriction of teachers to curriculum prescritions impair their intepreation of the intended curriculum.

Moreover, the first research question was also largely addressed by the reflections participants shared when reflecting on teaching resources. Interestingly, participants had relatively noticeable autonomy with regard to selecting teaching resources for topography. However, they mostly relied on hardware resources such as maps, textbooks, study guides, worksheets and mapset instruements. Some of these resources are recommended in the curriculum policy. Nonetheless, teachers had the power to decide to use them and how. Thus, although the CAPS curriculum policy is highly prescriptive, there is little room for teacher autonomy in its implementation. Participants' reflections also reveal that software resources such as PowerPoint slides may also be useful in teaching topography. However, teachers are demotivated by various issues from incorporating ICT technologies in their teaching, which incluse limited access to computers, large class sizes and the amount of time needed to plan computer-based teaching activities. Further, participants' reflections show that some teachers are not ware of ideological ware resource while others exercise it unconciously. This suggests that habits have a way of manifesting in teachers' selection of teaching resources for topography teaching. Thus, teachers do not take full advantage of their autonomy in deploying their ideological ware resource that dictates which hardware or software resources they use for teaching topography.

6.2.2 What informs geography teachers' reflections on the teaching of topography?

Participants reflections on accessibility addressed the second research question which sought to understand the issues that informs geography teachers' reflections on teaching topography. It can be gleaned from participants' responses that their reflections were largely influenced by their proximity to the school and cultural diversity in schools. Participants' reflections reveal that South African schools are disproportionately accessible to teachers. This causes disparities in the teaching hours that are recommended for teaching topography. Teachers who teach in the neighbourhoods in which they live are able to adhere to the recommended teaching hours for topography while those who live far from the schools they work lose some of their teaching time to traffic congestions. This suggests that teachers' proximity to the school may positively or negatively affect the teaching of topography. Thus, the accessibility of the school may influence the quality of education. This impelled teachers to reflect from the technical level of reflection and consider ways in which they can supplement the lost time. Further to this, it is also worth noting that participants' reflections were also informed by the cultural diversity that made it a challenge for teachers to communicate topography content to learners. This suggests that cultural diversity in schools propelled teachers to reflect critically upon their practice to evaluate the equatability of their teaching approaches.

In addition to the above, the second research question was also addressed by the reflections participants iterated when reflecting on the teacher role. It appears that geography teachers' reflections on teacher role when influenced and conflicted by the curriculum prescriptions and the nature of the CAPS policy document (performance-based curriculum approach). Some of the teachers were seemingly aware that the CAPS document demands that they assume a facilitator role by implementing learner-centred lessons. However, this demand colludes with the nature of the CAPS document as it is a performance-based curriculum. As a result, some teachers believed they implemented learner-centred topography lesson (dictated by the curriculum) but defined teacher-centred approaches when they reflected on their topography teaching (dictated by the nature of the CAPS curriculum). Thus, the misalignment between the CAPS expectations and its nature leaves teachers in a conundrum where they do not know whether to tailor their teaching according to the nature of the curriculum they are implementing or the expectations of the curriculum designers. However, other teachers were able to adhere to the nature of CAPS by adopting an instructor role and deploying teacher-

centred lessons or adopt both facilitator or instructor roles (influenced by both the nature of the CAPS policy and its demands).

Moreover, participants reflections on teaching activities indicate that the activities teachers use to teach topography are largely influenced by their understanding of their roles as teachers. Teachers believe that they should be at the forefront of teaching as the experts. This neccessitates the instructor role. As such, teachers use teacher-centred teaching activities to teach when teaching topography. Such teaching activities afford teachers the opportunity to drive the learning process. Notably, the teaching activities were also informed by the learning outcomes of the CAPS curriculum policy. Teachers used teaching activities to foster the expected learner skills in topography teaching. Reasonably, the teaching activities were also informed by assessments that teachers' use to assess learners' acquisition of learner skills, especially the summative assessment required by the curriculum policy document. This suggests that teaching activities are influenced by the teacher role, teaching goals and assessment requirements. As such, the teaching activities for topography should align with the teaching goals (aims, objectives and outcomes). In turn, the teaching goals inform assessment. This impelled participants to engage in technical reflections in an attempt to ensure that their teaching activities were aligned with the curriculum goals of topography.

Furthermore, the second research question was also largely addressed by the reflections participants shared when reflecting on the content they teach in topography. Participants' reflections revealed that the content they taught in topography is determined by the goals of the geography subject. Thus, teachers ought to consider the aims, objectives and outcomes of geography when reflecting on the content they teach in topography. Participants' reflections show that the purpose of topography is to bring about practical learning experiences where learners can interact the real-world to have a holistic understanding of the theoretical knowledge of geography and how it is represented in maps. Hence, teachers use topography to bring about integrated learning in geography where they incorporate other knowledge strands of geography (climatology, geomorphology, human geography and economic geography) when teaching topography. This induced technical and practical reflections as participants were able to consider the teaching goals that influence the subject matter offered

in topography and how the topography component relates to the holistic content knowledge of the geography subject.

6.2.3 What lessons can be learned from geography teachers' reflections on the teaching of topography?

The reflections iterated regarding location and time for teaching topography addressed the third research question. Participants reflected from the technical (teaching hours) and critical (teaching environment) levels of reflections. It may be gleaned from participants' reflections that geography teachers do not have time to facilitate fieldwork-based learning activities. Their fieldwork activities are restricted to studying topographical features surrounding the school environment. This causes teachers to rely mostly on classroom-based teaching activities and teach the topography content in a theoretical manner where teachers take the lead in the discussion (instructor role) by imparting the expected learner skills (learning outcomes) and explaining the connections between topography and other knowledge of geography. It may also be gathered from participants' reflections that the time teachers designated for teaching topography varied greatly. Some teachers taught topography within a week in each term while other dedicated either two or three weeks towards teaching topography. Thus, the teaching of topography across South Africa is not uniform. It can therefore be learnt that more time is needed for topography teaching to ensure that teachers are able to teach topography effectively. The schools should also raise funds for excursions in order to organise effective fieldwork learning experiences.

In addition to the above, participants' reflections on assessment also largely addressed the third research questions. It may be gleaned from participants' reflections that teachers use assessments to evaluate learners' acquisition of the learning outcomes and gauge the efficacy of their teaching methods. Thus, assessments require teachers to reflect upon their practice by identifying the gaps between the implemented curriculum (taught skills) and achieved curriculum (learned skills). Teachers also reflect on the causes of the mismatch between implemented and achieved curriculum and take remedial actions. Thus, it can be understood from the teachers' perspectives that reflections and assessments are interconnected processes. Effective teacher reflection propels teachers to review assessment data and identify areas of improvement in their teaching strategies. In this way, the level at which teachers reflect upon their practice influence the kind of remedial support and feedback they give to learners.

Furthermore, participants reflections illuminate that non-African teachers struggle to make topography content accessible to African learners as they cannot code-switch between English and IsiZulu. The findings show that the language of teaching and learning (LOLT) negatively impacted the teaching of topography for some teachers. This suggests that the remedial support teachers may offer to learners may also be impeded by the language barrier. In other words, some teachers may be able to support learners who speak English as their home language much better than learners who take English as their additional language. Thus, there is unequal access to education in South Africa due to the language barrier.

6.3 Recommendations for future research

This study recommends the following suggestions for future research:

- The literature review indicates that there are limited studies on teachers' reflections on teaching topography. Therefore, this study proposes that a similar study is conducted in a different context to enclose the inconsistency on the number of studies relating to teachers' reflections on teaching topography.
- The findings of this study indicate that the language divide between teachers and learners hampers the teaching of topography in multiracial schools. Thus, critical research studies in multiracial schools may be useful for teacher transformation in terms of improving the integration of African learners in Model-C and Indian schools.
- The findings of this study also indicated that teachers were aware of some issues that impeded their teaching (technical and practical reflection). However, they could not engage in deep thinking (critical reflection) to find solutions to these problems. Thus, a study centred on teacher reflection is needed in the teaching of topography.

6.4 Recommendations

6.4.1 Recommendation 1: Teaching rationale

The findings of this study indicate that geography teachers lean more towards the professional rationale and overlook the personal and societal rationale when teaching topography. The findings collude with that of the literature review where teachers were found to draw mostly from their societal and personal rationale when teaching (Makumane &

Khoza, 2020; Mpungose, 2015; Nzuza, 2019). Therefore, it is recommended that a comparative study is conducted to understand how teachers' knowledge of all three teaching rationale would influence their implementation of the intended curriculum. A group of teachers would need to be taught about all three categories of teaching rationale before they reflect upon their teaching while the other group should be treated as a control group. A study of this nature may help give insights whether should the CAPS curriculum policy clearly outline the teaching rationales from which teachers are expected to draw from when implementing this curriculum policy in attempt to ensure balanced teaching rationales.

6.4.2 Recommendation 2: Accessibility

Findings indicate that teachers were limited by the cultural divide in making the topography content accessible to all learners. Seemingly, the issue of cultural divide between teachers and learners seems to be a prevalent problem in many multiracial schools of South Africa as the findings of this study were confirmed by several earlier studies that have looked into this issue. As such, it is recommended that a cross-sectional study in multiracial schools is conducted in ways in which Black, White, Coloured, and Indian teachers could offer collegial support to their colleagues of different race with regards to dealing with learners of their own racial group. This could potentially minimise the issue of a certain racial group of teachers being favoured more by learners than other racial groups.

6.4.3 Recommendation 3: Teaching goals

Findings indicate that teachers are not clear about the aims, objectives, and outcomes of teaching topography. Therefore, subject advisors should capacitate teachers on the reasonings (aims, objectives and outcomes) that underpin the content knowledge of geography. This can be done during curriculum content workshops to ensure that the intended curriculum is understood by teachers. When teachers are not aware of the teaching goals of a subject, their implementation of the curriculum might be distorted from the intended curriculum (Sethole, 2004). Therefore, curriculum advisors should outline clearly to teachers how the teaching goals are presented in the CAPS curriculum and their importance in teaching.

6.4.4 Recommendation 4: Content

The findings from data analysis indicate that teachers overlooked fieldwork when communicating the topography content. Therefore, the geography subject advisors should demonstrate how fieldwork can be done by teaching topography during the curriculum content workshop. Fieldwork is important in geography because geography is a practical subject (Innes, 1998). The knowledge strands of geography (climatology, geomorphology, settlement geography, and economic geography) relate to human experiences. These knowledge strands are commonly taught theoretically and infused practically through topography. However, findings from data analysis show that teachers taught topography theoretically, as they did not conduct any practical/fieldwork. The topography provides real-life context of geography content. Therefore, fieldwork-based teaching activities should be included in the CAPS curriculum to ensure learners are given real-life learning experiences in geography to promote meaningful learning and effective teaching.

6.4.5 Recommendation 5: Teaching activities

The findings of this study show that teachers use different teaching activities to teach topography. Therefore, this study proposes that the CAPS curriculum should be reviewed to clearly articulate the teaching activities teachers should use for teaching topography. When teachers use different teaching activities, their implementation of the CAPS curriculum will not be uniform. This would cause a big gap in learner performance in topography across South African schools. Therefore, to standardise the teaching of topography within the CAPS curriculum, the policy should include informal and formal teaching activities that teachers should use for teaching topography. This would assist even inexperienced teachers to employ appropriate teaching activities when teaching topography.

6.4.6 Recommendation 6: Teacher role

Findings from the data analysis indicate that teachers confuse the instructor role for the facilitator role. While they believed they were implementing learner-centred classes, their reflections indicated a centred approach. Therefore, it is recommended that the CAPS curriculum should be clear on which role teachers should assume when teaching topography and how they should implement that particular role. This would assist teachers in adopting

appropriate teacher roles and deciding on the teacher activities that align with their anticipated teacher role. Thus, it is necessary for CAPS to undergo a curriculum review process to redefine the teacher's role in the curriculum. Further, the curriculum needs to encourage teachers as lifelong learners to research and read educational publications to expand their pedagogical knowledge for better implementation of the CAPS curriculum.

6.4.7 Recommendation 7: Teaching resources

Findings from the data analysis suggest that schools have limited access to ICT or that the available computers in schools do not have fully functioning software components. Therefore, this study proposes that DBE should increase the number of computers provided in schools. DBE should also ensure that it has supporting software components (internet, PowerPoint, etc) to ensure these resources are usable for teaching topography. Khoza and Manik (2016) argue that some of the teachers in schools are digital immigrants and struggle with using technological tools in their teaching of topography. Therefore, the department should conduct ICT workshops where teachers are taught to use technology in teaching and learning.

6.4.8 Recommendation 8: Location and time

Findings from the data analysis suggest that teachers teach topography within the classroom environment and towards the end of the term. Thus, less time is given to topography teaching and learners are not adequately exposed to real-life topography learning opportunities. Therefore, it is recommended that a pilot study is conducted where certain schools are given more teaching time for topography and financial support to conduct excursions to expose learners to real-life topography. This would assist in determining whether the amount of teaching time designated for topography influences learner performance and whether would fieldwork-based topography teaching have an effect on learners' understanding of topography. Thereafter, a large-scale study could be carried to look into these effects and ultimately determine directions for effective topography teaching.

6.4.9 Recommendation 9: Assessment

Findings from data analysis suggest that teachers mostly rely on informal and formal assessment activities when teaching topography and neglect continuous assessment activities. Therefore, it is recommended that the CAPS curriculum be reviewed to provide examples of assessment activities that teachers should use when teaching topography. Teachers should also be involved in moderation (school-based or cluster-based) to expand their knowledge of CAPS requirements in terms of assessment. This would ensure that learners are assessed effectively, and teachers neglect no assessment methods necessary. Further, findings from data analysis indicate that teachers use informal assessment activities to prepare learners for formal assessment. Therefore, it is recommended that teachers familiarise themselves with Blooms' taxonomy to ensure that the topographic skills they teach in topography align with the skills assessed in formal assessments (teaching outcomes).

6.5 Conclusion

In conclusion, this chapter has provided a summary of this study. It has outlined the findings and conclusions. Based on the findings from the data analysis, this chapter has also provided suggestions for future research. The findings indicated that curricular spider web concepts are essential in topography teaching, and teachers need to adequately reflect upon these concepts. As a result, this chapter has also provided recommendations for each concept to improve the teaching of topography in South African schools.

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APPENDICES

Appendix A: Ethical approval

16 March 2023

Lucky Nhlanhla Khumalo (217065370)
School Of Education
Edgewood Campus

Dear LN Khumalo,

Protocol reference number: HSSREC/00005252/2023
Project title: Geography teachers' reflections on teaching topography.
Degree: Masters

Approval Notification – Expedited Application

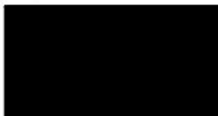
This letter serves to notify you that your application received on 02 February 2023 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

This approval is valid until 16 March 2024.
To ensure uninterrupted approval of this study beyond the approval expiry date, a progress report must be submitted to the Research Office on the appropriate form 2 - 3 months before the expiry date. A close-out report to be submitted when study is finished.

HSSREC is registered with the South African National Health Research Ethics Council (REC-040414-040).

Yours sincerely,



Professor Dipane Hlalele (Chair)

/dd

Humanities and Social Sciences Research Ethics Committee
Postal Address: Private Bag X54001, Durban, 4000, South Africa
Telephone: +27 (0)31 260 8350/4557/3587 **Email:** hssrec@ukzn.ac.za **Website:** http://research.ukzn.ac.za/Research-Ethics

Founding Campuses: Edgewood Howard College Medical School Pietermaritzburg Westville

INSPIRING GREATNESS

Appendix B: Permission to conduct research from DoE

KWAZULU-NATAL PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

OFFICE OF THE HEAD OF DEPARTMENT

Private Bag X9137, PIETERMARITZBURG, 3200
Anton Lembede Building, 247 Burger Street, Pietermaritzburg, 3201
Tel: 033 392 1063
Email: Phindile.duma@kzndoe.gov.za

Enquiries: Phindile Duma
Ref.:2/4/8/41137

Mr LN Khumalo
[redacted]
CHATSWORTH
4092

Dear Mr Khumalo

PERMISSION TO CONDUCT RESEARCH IN THE KZN DoE INSTITUTIONS

Your application to conduct research entitled: **"EXPLORING GEOGRAPHY TEACHERS' REFLECTIONS OF TEACHING TOPOGRAPHICAL MAPS IN FET PHASE",** in the KwaZulu-Natal Department of Education Institutions has been approved. The conditions of the approval are as follows:

1. The researcher will make all the arrangements concerning the research and interviews.
2. The researcher must ensure that Educator and learning programmes are not interrupted.
3. Interviews are not conducted during the time of writing examinations in schools.
4. Learners, Educators, Schools and Institutions are not identifiable in any way from the results of the research.
5. A copy of this letter is submitted to District Managers, Principals and Heads of Institutions where the Intended research and interviews are to be conducted.
6. The period of investigation is limited to the period from 26 September 2022 to 31 August 2025.
7. Your research and interviews will be limited to the schools you have proposed and approved by the Head of Department. Please note that Principals, Educators, Departmental Officials and Learners are under no obligation to participate or assist you in your investigation.
8. Should you wish to extend the period of your survey at the school(s), please contact Miss Phindile Duma at the contact numbers above.
9. Upon completion of the research, a brief summary of the findings, recommendations or a full report/dissertation/thesis must be submitted to the research office of the Department. Please address it to The Office of the HOD, Private Bag X9137, Pietermaritzburg, 3200.
10. Please note that your research and interviews will be limited to schools and institutions in KwaZulu-Natal Department of Education.

UMLAZI DISTRICT

[redacted]

Mr GN Ngcobo
Head of Department: Education
Date: 28 September 2022

GROWING KWAZULU-NATAL TOGETHER

Appendix C: School principal letter

Khumalo LN

[redacted]

[redacted]

4092

[redacted],

[redacted],

[redacted],

4048

Dear School Principal

Application for Permission to Conduct Research at your School

My name is Lucky Nhlanhla Khumalo. I am Curriculum Med. Candidate studying at the University of KwaZulu-Natal, Edgewood Campus, South Africa. I am interested in exploring geography teachers' reflections of teaching topography. I have observed that some geography teachers seem to experience challenges with regards to teaching topography. The proposed project will be an interpretive research study. It will use a reflective activity and one interview with the geography teacher to gain insights into the teaching of topographical maps in schools. Therefore, to generate data, the above-mentioned educational institution under your supervision is of paramount importance for this project to be successful. I would therefore like to request your permission to use your school and geography teachers to conduct this research project. Please note the following:

- The school and teachers' confidentiality is guaranteed.
- The one-on-one semi structured interview will last for 45 minutes.
- Any information provided by your teachers cannot be used against the school, and the generated data will be used for the purpose of this study only.
- There will be no limit on any benefit that the school and teachers may receive as part of participation in this research study.
- Data will be stored in secure storage and destroyed after 5 years.
- Teachers have a choice to participate, not participate or stop participating in the research. The school and teachers will not be penalised for taking such an action.

- The school and teachers are free to withdraw from the research at any given time without any negative or undesirable consequences.
- Real names of the school and teachers will not be used but numbers such as 1 2 3 4 will be used to represent school and teachers' names.
- School and teachers' involvement is purely for academic purpose only, there are no financial benefits involved

For further information regarding the research, you may use the following details:

Supervisor: Dr Makhosazana Shoba

Lecturer: Curriculum and Education Studies

Email address: shobam@ukzn.ac.za

Office: 031 260 3688

Or

Mr Lucky Khumalo

Email address: 217065370@stu.ukzn.ac.za

Cell: [redacted]

Furthermore, you may contact the

UKZN Humanities & Social Sciences

Research Ethics Committee at

Private Bag X 54001

Durban – 4000 KwaZulu-Natal,

Tel: 27 31 2604557

Fax: 27 31 2604609

Email: HSSREC@ukzn.ac.za

Yours faithfully,

L.N Khumalo

Thank you for your contribution to this research.

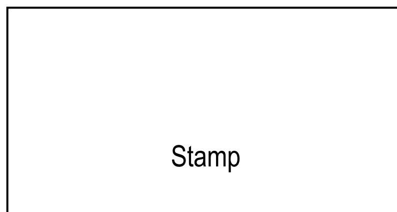
Please sign the following declaration and include your full names as indicated:

I………………………………………………………………………. (Full names of the school Principal) hereby confirm that I understand the contents of this document and nature of this research project, I consent to participating in the research project.

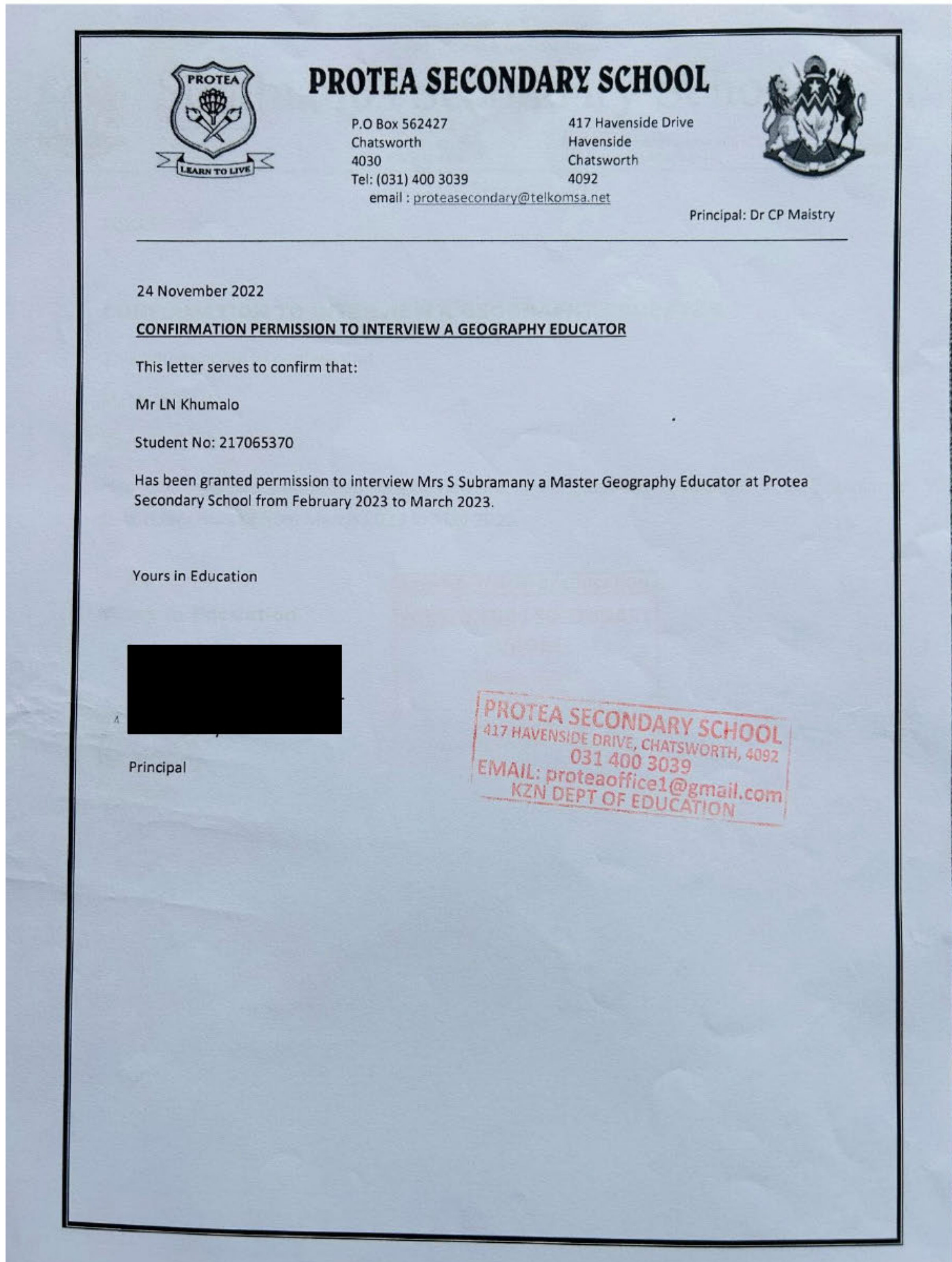
I understand that I am at liberty to withdraw from the project at any time, should I desire.

………………………………… ……………………………..

Signature of Principal **Date**



Appendix D: Permission to conduct research from the school principal.



PROTEA SECONDARY SCHOOL

P.O Box 562427
Chatsworth
4030
Tel: (031) 400 3039

417 Havenside Drive
Havenside
Chatsworth
4092

email : proteasecondary@telkomsa.net

Principal: Dr CP Maistry

24 November 2022

CONFIRMATION PERMISSION TO INTERVIEW A GEOGRAPHY EDUCATOR

This letter serves to confirm that:

Mr LN Khumalo

Student No: 217065370

Has been granted permission to interview Mrs S Subramany a Master Geography Educator at Protea Secondary School from February 2023 to March 2023.

Yours in Education

Principal

PROTEA SECONDARY SCHOOL
417 HAVENSIDE DRIVE, CHATSWORTH, 4092
031 400 3039
EMAIL: proteaoffice1@gmail.com
KZN DEPT OF EDUCATION

Appendix E: Participant informed consent form

Khumalo LN

[redacted]

[redacted]

4092

Dear Participant

INFORMED CONSENT LETTER

My name is Lucky Nhlanhla Khumalo. I am Curriculum Med. Candidate studying at the University of KwaZulu-Natal, Edgewood Campus, South Africa. I am interested in exploring geography teachers' reflections on teaching topography. I have observed that some geography teachers seem to experience challenges with regards to teaching topographical maps. The proposed project will be an interpretive case study. Thus, to generate data, I am interested in asking some questions. Please note the following:

- The school and teachers' confidentiality is guaranteed.
- The interview may last for an hour.
- Any information provided by your teachers cannot be used against the school, and the generated data will be used for the purpose of this study only.
- There will be no limit on any benefit that the school and teachers may receive as part of participation in this research study.
- Data will be stored in secure storage and destroyed after 5 years.
- Teachers have a choice to participate, not participate or stop participating in the research. The school and teachers will not be penalised for taking such an action.
- The school and teachers are free to withdraw from the research at any given time without any negative or undesirable consequences.
- Real names of the school and teachers will not be used but numbers such as 1 2 3 4 will be used to represent school and teachers' names.
- School and teachers' involvement is purely for academic purpose only, there are no financial benefits involved.

- If you are willing to be interviewed, please indicate (by ticking as applicable) whether or not you are willing to allow the interview to be recorded by the following equipment.

	Willing	Not willing
Audio equipment		

For further information regarding the research, you may use the following details:

Supervisor: Dr Makhosazana Shoba

Lecturer: Curriculum and Education Studies

Email address: Shobam@ukzn.ac.za

Office: 031 260 3688

Or

Mr Lucky Khumalo

Email address: 217065370@stu.ukzn.ac.za

Call: [redacted]

Furthermore, you may contact the

UKZN Humanities and Social Sciences

Research Ethics Committee at

Private Bag X 54001

Durban – 4000 KwaZulu-Natal,

Tel: 27 31 2604557

Fax: 27 31 2604609

Email: HSSREC@ukzn.ac.za

Yours faithfully,

L.N Khumalo

Thank you for your contribution to this research.

Please sign the following declaration and include your full names as indicated:

I……………………………………………………………………. (Full names of participant) hereby confirm that I understand the contents of this document and nature of this research project, I consent to participating in the research project.

I understand that I am at liberty to withdraw from the project at any time, should I desire.

……………………………………. **…………………………….**

Signature of Participant **Date**

Appendix F: Reflective activity

Full name: __________________________

School name: __________________________

This reflective activity is for your reflections of teaching topography (topographical maps) in the geography subject within the CAPS curriculum. You may use various sources to complete this activity. Presents your reflections by following the curricular spider-web themes as follows:

1. Why are you teaching topography (Rationale/vision)?

____

____

____

2. Which goals are you teaching (Aims, objectives, outcomes) topography towards?

____

____

____

3. What content are you teaching in topography?

____

____

____

4. Which activities are you using to teach topography?

____

____

____

5. What resources are you using to teach topography?

____

____

____

6. How do you facilitate learning (Teacher role) of topography?

7. Where and When are you teaching (Location) and (Time allocation) topography?

8. How do you assess learning (Assessment) of topography?

9. How do you access (accessibility) the teaching of topography?

Appendix G: Semi-structured one-on-one interview

Full name: ____________________________

School name: ____________________________

This individual interview is for reflections on topography teaching. The interview will require you to revisit your past and present experiences and opinions regarding topographical maps teaching within the CAPS curriculum. The interview questions will be framed by the curricular spider web as it will be used as framework for this study.

1. Why are you teaching topography (Rationale/vision)?

2. Which goals are you teaching (Aims, objectives, outcomes) topography towards?

3. What content are you teaching in topography?

4. Which activities are you using to teach topography?

5. What resources are you using to teach topography?

6. How do you facilitate learning (Teacher role) of topography?

7. Where and When are you teaching (Location) and (Time allocation) topography?

8. How do you assess learning (Assessment) of topography?

9. How do you access (accessibility) the teaching of topography?

Appendix H: Certificate of editing

CERTIFICATE

OF EDITING

THIS CERTIFICATE IS PROUDLY PRESENTED TO

Lucky Khumalo

It is certified that the dissertation is edited by the professional editors at Sibelihle Holdings (Pty) Ltd for accuracy of the language, format, and grammar use.

This certificate is generated and verified by Sibelihle Holdings (Pty) Ltd and attested the fact that the editor did not alter the idea and aim of the researcher.

24/01/2024

Date

Signature

Appendix I: Turnitin Ccertificate

Dissertation 2

ORIGINALITY REPORT

9%	8%	3%	0%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

#	Source	%
1	researchspace.ukzn.ac.za Internet Source	4%
2	hdl.handle.net Internet Source	1%
3	Kehdinga George Fomunyam, Simon Bheki Khoza. "Curriculum Theory, Curriculum Theorising, and the Theoriser", Brill, 2021 Publication	<1%
4	scholar.sun.ac.za Internet Source	<1%
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