UNIVERSITY OF KWAZULU-NATAL

EXPLORING INCLUSIVE PRACTICES IN THE INTERMEDIATE PHASE MATHEMATICS CLASSROOM AT UMLAZI DISTRICT

BY

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DECLARATION

I, Nosipho Msomi, declare, that this study represents original work by the author and has not been submitted in any form to any other institution. All the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

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Nosipho Msomi Date

ABSTRACT

The study sought to explore inclusive practices in intermediate phase mathematics classrooms in Umlazi District, KwaZulu-Natal, South Africa. This study sought to explore the experiences of mathematics educators in the intermediate phase, the challenges they face in the implementation of inclusive education, and the types of support and assistance they need. The South African government has implemented numerous changes in education since the 1994 democratic elections, and adopted a policy of inclusive education in 2001. Inclusive education requires educators to ensure that their classrooms and teaching strategies accommodate all learners, regardless of their diversity, in order for all learners to succeed. This study finds that educators have been tasked with the responsibility of implementing the inclusive education policy, and have been faced with diverse challenges that have stalled the successful implementation of inclusive education. Educators need support, guidance and resources to overcome these challenges. The lack of support educators currently receive raises grave concerns regarding the quality of education in South Africa, as does the poor scholastic achievement of learners in mathematics.

The aim of this study was to explore inclusive education practices in the intermediate phase mathematics classroom from the perspective of the educators. An interpretivist research philosophy was therefore used to investigate these perspectives, grounded in a social constructivist world view underpinned by the work of Lev Vygotsky. A qualitative research approach was used to construct the investigative interpretivist framework. A case study strategy was used, and qualitative data from eight mathematics teachers in the intermediate phase was generated through scheduled interviews and questionnaires. The data was analysed using thematic analysis that adhered to Braun and Clarke's (2006) six steps.

The findings of this study highlighted the need for appropriate educator training at tertiary level; on-going professional development of existing educators; provision of basic teaching resources, and specific resources for mathematics; the recognition of overcrowding, and a reduction of class sizes; the recognition that language barriers contribute enormously to conceptual gaps in mathematics, and the provision of additional resources to address this; and the need for parents to play an active and responsible role in their children's education.

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DEDICATION

I dedicate this thesis to my parents, my two late brothers and my niece, for nurturing in me affections and love, and their constant dedicated partnership for success in my life.

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LIST OF ABBREVIATIONS

ANA	Annual National Assessment
CAPS	Curriculum Assessment Policy Statement
DBE	Department of Basic Education
DoE	Department of Education
EU	European Union
FAL	First Additional Language
GET	General Education and Training
HL	Home Language
IDEA	Individuals with Disabilities Education Act
JPTD	Junior Primary Teachers‘ Diploma
KZN	KwaZulu-Natal
LoLT	Language of Learning and Teaching
LSEN	Learners with Special Educational Needs
NCTM	National Council of Teachers of Mathematics
RDP	Reconstruction and Development Programme
RSA	Republic of South Africa
SEN	Special Educational Needs
SGB	School Governing Body
SPTD	Senior Primary Teachers‘ Diploma
TIMSS	Trends in International Mathematics and Science Study
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNCRPD	United Nations Convention on the Rights of Persons with Disabilities
ZPD	Zone of Proximal Development

CHAPTER 1

INTRODUCTION TO THE STUDY

1.1 INTRODUCTION

Education — the act or process of educating or being educated — is a basic human right. This is proclaimed in the United Nations Educational, Scientific and Cultural Organisation's (UNESCO) Universal Declaration of Human Rights, and has been reaffirmed by the World Declaration for All (UNESCO, 1994a). However, humans are extremely diverse in their abilities and approaches, and only an inclusive education policy can fairly and productively ensure that educational practices productively include such diversity. According to UNESCO (1994b), inclusive education is both a process and an approach to education. As a process it requires the modification of curriculum content, structure, language, and background in order to include all learners (UNESCO, 2002). The mathematics curriculum has been identified as one of the major challenges in developing and implementing inclusive educational practices (UNESCO, 2003, p. 16). There are several curriculum-based and practice-based factors that limit learners 'inclusion in the intermediate phase mathematics classroom, such as curriculum content, assessment practices, teaching styles, and the learners 'abilities and backgrounds (Department of Basic Education (DBE), 2011, p. 4). Inclusive practices in the intermediate phase mathematics classroom involve differentiating instructions by identifying the various learners 'strengths, needs and interests, and adapting the lessons to match those.

1.2 FOCUS OF THE STUDY

The fundamental aim of inclusive education is the provision of the human right to education to all learners, regardless of their diverse abilities and backgrounds, and the preparation and training of all learners for 21st-century globalised society (UNESCO-IBE, 2014; European Agency, 2015). South Africa is a rapidly growing country whose economic development

largely depends on its citizens acquiring skills and knowledge through competent teaching. South Africa is also in pursuit of a policy of inclusive education. Inclusive education, in a nutshell, considers how to alter the education system by eradicating the barriers that prevent learners from participating fully in education, in order for knowledge and skills to be accessible to all learners. Marishane, Marishane and Mahlo (2015) state that one important way to ensure children's right to education is for teachers as duty bearers to guarantee that the curriculum is not only accessible to all learners but also inclusive of all learners. Empirical research studies that have been done in the past, point to the fact that teaching and learning is less effective if the educators' knowledge of good assessment is inadequate or lacking (Vandeyar & Killen, 2003 in Kakoma, 2016).

1.3 RATIONALE OF THE STUDY

Teaching mathematics in the foundation and intermediate phase has been the researcher 's first choice for 23 years. The school at which the researcher is currently teaching is situated in a township and lacks certain basic and necessary resources. As educators we are compelled to devise our own teaching strategies to enable the learners to comprehend mathematics. I have been part of the many changes in the South African context that have had an impact on education in schools. My personal interest in the process of transforming an education system that still bears the marks of the social and political inequalities of the past, is embedded in a desire to stimulate meaningful change in South African society. For this to occur it is pivotal to understand the broader socio-political perspective within which schooling and learning occurs. It has therefore become of paramount importance to me to assess inclusive education practices in the intermediate phase mathematics classroom, in order for all learners to be adequately served by the education system.

Mathematics has been my favourite subject since the Foundation Phase, where I excelled at it. Due to a high failure rate in mathematics, our school created a special class between Standard 2 (Grade 4) and Standard 3 (Grade 5) called the ―Graduation‖ class. If learners made satisfactory progress in this class, they were promoted to Standard 3 during the course of the year. Those who made slow progress were promoted to Standard 3 at the end of the

year. This method of sorting and streaming learners is in stark contrast to today ‘s dominant educational philosophies and approaches, both in South Africa and globally, which focus strongly on inclusive education. In South Africa the inclusive approach to education is defined and expressed in *Education White Paper 6: Special Needs Education: Building an inclusive education and training system* (Department of Education (DoE) 2001), which outlines what an inclusive education and training system is, and how the South African government intends to develop such a system. It provides a framework for establishing an inclusive education system, details a funding strategy, and lists the key steps to be taken. It states that mainstream education’s priorities should include multi-level classroom instruction so that teachers can prepare main lessons with variations that are responsive to individual learners ‘needs (DoE, 2001, p. 19).

The researcher has also chosen this study because of a personal professional interest in the inclusive intermediate phase mathematics classroom, which coincides with a national interest in mathematics teaching. I strongly believe that learners need a strong foundation in mathematics in order to achieve good results in their final matriculation exams. However, I am perturbed by the state of mathematics education in South Africa, the poor results of which are evident in the Trends in International Mathematics and Science Study (1995, 1999, 2003), International Competition and Assessment for Schools (2006), Human Sciences Research Council (2008) and Southern and Eastern Africa Consortium for Monitoring Education Quality (1999) assessment tests, described in detail by Sheinuk (2010). The poor performance by South African learners in all areas of mathematics indicates that there is a nationwide crisis in mathematics achievement. Yet a central precondition for national economic success, as argued by Hlalele (2012), is that the citizens of a country be numerically literate, and be able to understand and apply mathematics, as it is an indispensable aspect of the logic of our daily lives. Hlalele cites the fact that in 2011, one in six Grade 12 learners who wrote the final mathematics exam scored less than 10% for the exam (City Press, 2012). There has also been a massive decline in the number of learners enrolling for mathematics in recent years. Problems with maths start in the intermediate phase, and by the time learners reach matric that gap is insurmountable.

1.4 THE RESEARCH PROBLEM

The researcher embarked on this research study for professional and personal reasons. The researcher is a qualified educator, with a keen and vested interest in improving the conditions of educators and learners at schools. The central problem that the researcher has encountered is that learners are not doing well in mathematics in the intermediate phase, and are struggling with basic operations and computation. The researcher's direct observations and experience are supported by Raoano (2016, p. 7), who states that

Learners at school are unable to break complicated descriptions into small parts, to understand those parts and to see the relationship between them. Learners are not familiar with the skill of interrogating a word problem for understanding. Lacking this skill leads the learners to be unable to translate the word problem into mathematics expression.

Consequently, mathematics has a high failure rate. This is also observed by Marishane et al. (2015), who state that the quality of mathematics teaching in South African schools is amongst the worst in the world. An additional concern is educators 'general lack of formal training in special education. This training would equip them with the necessary materials and resources to be the drivers of change in promoting and sustaining inclusive education (Mayaba, 2008).

1.5 AIM OF THE STUDY

The primary aim of this study was to qualitatively assess inclusive education practices in the intermediate phase mathematics classroom.

1.6 OBJECTIVES OF THE STUDY

The objectives of the study were as follows:

- To explore the educators 'perceptions and practices of inclusive education in the intermediate phase mathematics classroom.
- To understand Mathematics teachers' adherence to what is stated as inclusivity in their teaching.
- To provide recommendations on how inclusive education practices can be improved in the intermediate phase mathematics classroom.

1.7 RESEARCH QUESTIONS

The study was guided by the following research questions:

- What are educators' perceptions of inclusive education and what their practices in the intermediate phase mathematics classroom are?
- Are Mathematics teachers adhering to what is stated as inclusivity in their teaching?
- How does inclusive education need to be improved in the intermediate phase mathematics classroom?

1.8 THEORETICAL AND CONCEPTUAL FRAMEWORK

The theoretical framework provides the foundation for conducting research to explore a particular problem. Henning, Van Rensburg and Smit (2004) and Mahlo (2011) state that a study 's theoretical framework situates the study within the discipline in which the researcher is working, and is comprised of a combination of formal theories to elucidate the various aspects of the field of research in question (Maja, 2015).

CONCEPTUAL FRAMEWORK

1.8.1 Inclusion

Inclusion is a key concept in this study. The term ―inclusion‖, in the context of education, refers to the policy of accepting learners with special needs into the mainstream school

context, and ensuring that they adapt successfully. Inclusion has become the global norm for education in the 21st century, and the concept of inclusive education is widely accepted as the best means of allowing every child to be equally valued and involved in the system of education, regardless of their difference in terms of disability, sex, religion, ethnicity, or anything else (Mitiku, Alemu & Mengsitu, 2014). The purpose of conducting this research was to assess educators' perceptions and practices of inclusive education in the intermediate phase mathematics classroom. The motivation for conducting the research is both professional and personal, as the researcher is a qualified educator and is therefore well placed to observe the conditions of educators and learners at schools. As a practising educator, the researcher is also well placed to formulate recommendations that can assist with strengthening inclusive education.

THEORETICAL FRAMEWORK

1.8.2 Constructivist theory

In this study, constructivist theory formed the basis for assessing inclusive education practices in the intermediate phase mathematics classroom. Hein (1999) in Kussumua (2007, p. 14) defines constructivism as ―a theory based on observation and the scientific study of how people learn‖ and further states that ―people construct their own understanding and knowledge of the world through experiencing things and reflecting on those experiences‖. Airasian and Walsh (1997) in Jensen (1998) also points out that ―Constructivism is not a unitary viewpoint‖, but is based on the fundamental principle that people create knowledge from the interaction between their existing knowledge or beliefs and the new ideas, information, or situations they encounter.

Most constructivists also agree on the need to foster interactions between learners' existing knowledge and new knowledge and experiences. In this way, learners construct their own knowledge or meaningful ideas by linking the newly received information to their existing knowledge and experience (Haruthaithanasan, 2010). According to the constructivist approach, learners are encouraged to direct and control their own learning, and educators play the role of facilitators, rather than performance evaluators. Creative approaches to

education that increase learners' knowledge, strengthen their capabilities and improve their attitudes are critical for personal development, for fostering a sense of personal fulfilment and inclusion, and for ultimately ensuring their constructive role as usefully employed members of society in the future **(**European Commission, 2004 p.3).

1.9 RESEARCH PARADIGM

The aim of this study was to explore inclusive education practices in the intermediate phase mathematics classroom from the perspective of the educators. An interpretivist research philosophy was therefore used to investigate these perspectives, grounded in a social constructivist world view underpinned by the work of Lev Vygotsky (Woolfolk, 2007). A qualitative research approach was used to construct the investigative interpretivist framework. The detailed reasons for selecting this particular philosophy and approach are provided in section 3.3.

1.10 RESEARCH DESIGN

1.10.1 Research strategy

This study adopted a case study strategy, as described by Saunders, Lewis and Thornhill (2007, p.140). A case study strategy was chosen because it is suited to the qualitative investigation of a specific situation (in this case the experiences of intermediate phase mathematics educators in an inclusive environment) in its real-life context. A detailed discussion of the characteristics and merits of a case study approach can be found in section 3.4.1.

1.10.2 Research setting

The study was conducted at three primary schools located in KwaMakhutha, township area under Umbumbulu tribal authority in Durban, KwaZulu-Natal, South Africa. The schools

are in Mafa ward, 30 kilometres south of Durban. One school is quintile 3 and two schools are quintile 3. The total learner enrolment is between 300 and 1020 among the three schools. There are no libraries and laboratories in these schools, only library corners for extra reading and creative writing. The area has one municipality library that cannot accommodate all the library users especially young learners. The area has an estimated population of 24 336, consisting largely of Zulu-speaking black people. Crime and unemployment is high, and the school is surrounded by RDP (Reconstruction and Development Programme) houses. Most of the learners receive child support grants and are from poor socio-economic backgrounds. Most parents are illiterate and unable to assist in school work and homework.

1.10.3 Sampling strategy

Intermediate phase primary school teachers who are teaching mathematics in the Mafa cluster that falls under Umbumbulu circuit, in KwaZulu-Natal, were the target population for this research study. Convenience sampling was used to select educators who teach mathematics in the intermediate phase from Grade 4 to Grade 6, at three primary schools. These educators had three or more years of experience teaching mathematics in the intermediate phase. Section 3.4.3 contains a more detailed discussion of the sampling strategy and process used in this study.

1.11 Data Generation

Data was generated using one-on-one structured interviews with the selected sample of participants (see Appendix F for the interview schedule) and questionnaires, which contained primarily open-ended, qualitative questions (see Appendix G for the questionnaire). The interviews were audio taped (with the permission of the participants), transcribed, and coded for thematic analysis. These data collection procedure is discussed in more detail in section 3.4.4.

1.12 DATA ANALYSIS

The researcher used thematic analysis to analyse the qualitative data. Thematic analysis is a method for identifying, analysing and reporting patterns or themes within data (Mayaba, 2008). Braun and Clarke‘s (2006) method of thematic analysis was used, and this method involves six steps:

1. Becoming familiar with the data
2. Generating initial codes
3. Searching for themes
4. Reviewing potential themes
5. Defining themes
6. Writing up the themes.

These steps are described in detail in section 3.5.

1.13 METHODS TO ENSURE TRUSTWORTHINESS

Trustworthiness of data, according to Guba and Lincoln (1994), is a question of whether data can be considered credible, transferable, dependable, conformable and authentic. The researcher went to great efforts to select the participants carefully and gather and record the data accurately. The researcher was careful to understand and question her own assumptions, experiences and feelings when interpreting the data, in order to avoid bias, and ensured that the participants had an opportunity to check the validity of the thematic analysis. A detailed discussion of how the researcher gave attention to the five elements of trustworthiness is found in section 3.6.

1.14 LIMITATIONS OF THE STUDY

This research was limited to a small sample of educators at three primary schools in Umlazi

District, KwaZulu-Natal, South Africa. The sample was restricted to only intermediate phase educators who teach mathematics within Mafa cluster of Umbumbulu circuit. The findings cannot therefore be generalised, as they apply to a limited sample group and a very specific social, political, economic and cultural context.

1.15 ETHICAL CONSIDERATIONS

In accordance with Welman, Kruger and Mitchell's (2005) guidelines, the researcher ensured that informed consent was obtained from the participants, that their privacy was maintained, that they were protected from harm, and that no manipulative or unethical tactics were used to elicit information from them. These measures are discussed in detail in section 3.8.

1.16 OUTLINE OF CHAPTERS

Chapter 1 has discussed the focus of the study, the rationale for the study and the research problem. The aim of the study, the objectives and the research questions were presented, and the theoretical framework, research paradigm and research design outlined. The data collection and data analysis procedures were discussed, as well as the limitations of the study and the ethical considerations taken into account.

Chapter 2 discusses literature relevant to inclusive education, the intermediate phase in the inclusive environment, inclusive practices within this phase and within the mathematics classroom, assessment practices within the inclusive classroom, and general issues related to the implementation of inclusive education in the global and the South African context. In addition, it provides an overview of constructivist theory, which forms the theoretical approach to this study and underpins the data analysis

Chapter 3 discusses the methods that were used to collect data for analysis. It deals firstly with the overall research paradigm that informed the approach to data collection and

analysis (the research philosophy, approach and purpose), and then describes the overall research design (the research strategy employed, the research setting, the sampling procedure and the data collection procedure). The data analysis is then described, as well as the methods used to ensure trustworthiness in the data, the limitations of the study, and the ethical considerations that were taken into account

Chapter 4 presents and analyses the data collected using thematic analysis, and interprets it using constructivist theory.

Chapter 5 presents a summary of the research process, and a summary of the findings on the inclusive practices in the intermediate phase mathematics classroom, in accordance with the main themes that emerged from this study. A summary of the overall recommendations for the education community is then presented. Recommendations for further research are discussed, after which the limitations of this study are addressed, and a final overall conclusion is presented.

1.17 CONCLUSION

This chapter has provided a background to the study, and has discussed the focus of the study, the rationale for the study and the research problem. The aim of the study, the objectives and the research questions have also been presented, and the theoretical framework, research paradigm and research design outlined. The data collection and data analysis procedures have been discussed, as well as the limitations of the study and the ethical considerations taken into account. The following chapter discusses literature relevant to inclusive education, the intermediate phase in the inclusive environment, inclusive practices within this phase and within the mathematics classroom, assessment practices within the inclusive classroom, and general issues related to the implementation of inclusive education in the global and the South African context. In addition, it provides an overview of constructivist theory, which underpins the data analysis of this study.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter discusses literature relevant to inclusive education, the intermediate phase in the inclusive environment, inclusive practices within this phase and within the mathematics classroom, assessment practices within the inclusive classroom, and general issues related to the implementation of inclusive education in the global and the South African context. In addition, it provides an overview of constructivist theory, which forms the theoretical approach to this study and underpins the data analysis.

2.2 DEFINING INCLUSIVE EDUCATION

Going together is the beginning, keeping together is progress, and working together is success (Henry Ford, 1976).

A clear understanding of inclusive education on the part of educators, learners and administrators is a vital part of its successful implementation in the classroom. Lalvani (2014) notes that the necessary support required by educators may be linked to the manner in which they conceptualise inclusive education (Lalvani, 2014), and Mohanty and Nanda (2017) state that in order to achieve successful inclusion in their classrooms, educators need a very clear understanding of inclusive education policies and practices, in order to access the necessary skills and resources to implement appropriate inclusive strategies.

Various definitions of inclusive education focus on its intention to make education fairly and equally accessible to all learners, regardless of their diversity. Fredrickson and Cline (2009, p. 71) in Madihlaba (2013, p. 8) define inclusive education as ―a procedure by which a school attempts to answer to all pupils as individuals by reconsidering and

reconstructing its curricula organization, provision and allocating resources to improve equal opportunity‖. This view is supported by Khan (2017), who takes the definition a step further and focuses on equal participation and inclusion within the classroom, describing inclusive education as the process of responding to the diversity of children through enhancing participation in classrooms and reducing exclusion from education. Moscardini (2014) reinforces this approach, emphasising that all learners should learn together in the same place without being grouped, labelled or excluded. In this study, inclusive education refers to the practices that teachers utilise to accommodate learners who are battling academically in mathematics.

Inclusive education is defined as a collaborative approach to teaching based on the idea that all children can learn together, and that participation in learning requires responses to individual differences among learners that do not depend on ability labelling or grouping, or the withdrawal of the learner for additional classroom support.

Mo (2014) concurs that inclusive education is about making equal educational opportunities accessible to all students, irrespective of their biological, physiological, cultural and social conditions. Mahlo (2011, p. 16) supports the accommodation of the full diversity of learners, defining inclusive education as ―a learning environment that promotes the full personal, academic and professional development of all learners irrespective of race, class, gender, disability, religion, culture, sexual preference, learning styles and language.‖ Mohanty and Nanda (2017) state that the concept of inclusive education needs to be understood in the way that allows students with special needs to be placed and receive instruction in mainstream classes and to be taught by mainstream teachers. Mohanty and Nanda (2017) reinforce the other definitions by emphasising that every child has unique characteristics, interests, abilities and learning needs, and that educational programmes need to consider the wide diversity of these characteristics and needs.

Mittler (2005) emphasises that inclusion is not simply about placing learners with special needs in mainstream schools, but it is about changing schools to make them more responsive to the needs of all learners. Inclusive education is about helping all educators to accept responsibility for the effective learning of all learners in their school, and about

preparing educators to teach those learners who are currently excluded from their schools but may be brought into an inclusive classroom (Mittler, 2005).

Ntombela (2011) describes how educators are ―change agents‖ whose roles are crucial in the inclusive education environment (Ntombela, 2011). Mathibe (2007) recommends that educators' skills should be strengthened through programmes that equip them with the necessary attitudes, knowledge, values and skills to confidently and effectively implement inclusive education in their classrooms.

2.3 INCLUSIVE EDUCATION IN THE GLOBAL CONTEXT

2.3.1 The Salamanca Statement

The single biggest international commitment to inclusive education to date has been the *Salamanca Statement and Framework for Action on Special Needs Education*, signed at the World Conference on Special Needs Education: Access and Quality in Salamanca, Spain in June 1994 by over 300 international delegates that represented 92 governments and 25 international organisations.

It is commonly known as the Salamanca Statement and is framed by a rights-based perspective on education that expresses a strong commitment to reaffirming the right to education of every individual, as enshrined in the 1948 Universal Declaration of Human Rights, and renewing the pledge made by the world community at the 1990 World Conference on Education for All to ensure that right for all regardless of individual differences (UNESCO, 1994b, p. vii).

The signatory countries and individuals to the Salamanca Statement supported the following beliefs about education (UNESCO, 1994b, p. vii):

- Every child has a fundamental right to education, and must be given the opportunity to achieve and maintain an acceptable level of learning.
- Every child has unique characteristics, interests, abilities and learning needs.

- Education systems should be designed and educational programmes implemented to take into account the wide diversity of these characteristics and needs.

- Those with special educational needs must have access to regular schools which should accommodate them within a child-centred pedagogy capable of meeting these needs.
- Regular schools with this inclusive orientation are the most effective means of combating discriminatory attitudes, creating welcoming communities, building an inclusive society and achieving education for all; moreover, they provide an effective education to the majority of children and improve the efficiency and ultimately the cost-effectiveness of the entire education system.

The Salamanca Statement has been very influential in encouraging governments to adopt inclusive policies, and to reform their education systems to accommodate a much greater range of learner diversity. However, it does not describe specific practical recommendations for how educators can achieve inclusive classrooms in practice.

2.3.2 The international community

Inclusive education practices generally have a great deal of support in developed countries. Evans and Lunt (2005, p. 41) describe how inclusion has become ―a buzz-word in social and educational policy in the UK and the European Union, and also in the USA and further afield‖. Evans and Lunt (2005) note that politicians in these countries are increasingly emphasising a commitment to inclusion and social justice, and outline how all the EU countries and the USA now have legislation and strong policy frameworks in place that promote or mandate inclusive educational practices. Developed countries seem to have the advantage of generally resource-rich education systems that allow a relatively effective implementation of inclusive education policies.

Developing countries, however, seem to be struggling with both policy and implementation (Srivastava, de Boer & Pijl, 2013). In their survey on the implementation of inclusive education in developing countries over ten years, Srivastava, de Boer and Pijl (2013) found that only 16 developing countries (out of 140 in the survey) had any research projects at all on the inclusion of students with disabilities, and that these projects were often small scale and confined to a small area like a school or a city. They see this as a worrying sign that inclusive education is not seen as a serious priority in developing countries, noting that ―although a number of developing countries signed the recent United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) (2006), students with disabilities are not always taken care of in education policies‖ (Srivastava et al., 2006, p. 11). They note too that ―in most developing countries, regular schools have large classes with few teachers. Consequently, many teachers hesitate to work with students with disabilities, finding it an additional workload‖ (Srivastava et al., 2006, p. 11). Their review also showed that teachers receive very little support and attention in developing countries, and that parents' involvement with their children's schooling is generally extremely limited. Fernando, Yasmin, Minto and Khan (2010) argue that inaccessible school infrastructure, limited learning materials, limited capacity of teachers, poverty, disability, conflicts and lack of supporting policy frameworks are the major causes of exclusion from the mainstream education system.

2.4 INCLUSIVE EDUCATION IN THE SOUTH AFRICAN CONTEXT

2.4.1 South African policy framework for inclusive education

South Africa is a country of great social and economic inequality, and the South African education system in particular still bears the marks of the social and political inequalities of the past, many of which have continued into the present. Section 29 of the South African Constitution grants everyone the right to basic education, and the Bill of Rights enshrines the rights of all South Africans to human dignity, equality and freedom (Muringi, 2015). In the South African context, therefore, inclusive education is crucially necessary for the full

range of learners‘ needs to be met, in order to deliver their right to basic education, and to redress inequalities (DoE, 2001).

The framework for an inclusive education system is laid out in Education White Paper 6: Special Needs Education: Building an Inclusive Education and Training Systems (DoE, 2001), and the intention of this policy is to support all learners, teachers and the system, so that the full range of learning needs can be met. Implementing this policy, however, requires a significant shift in mind-set on the part of all stakeholders, who need to recognise that all children, youth and adults have the potential to learn, given the necessary support. It also requires the creation of systems for identifying and accommodating the diverse range of learning needs. However, as will be discussed and shown later in this chapter, and in the findings in Chapter 4, the inadequate implementation of inclusive education policies in South Africa has resulted in a breakdown of learning in the inclusive intermediate phase mathematics classroom.

The *Guidelines for responding to learner diversity in the classroom through the Curriculum and Assessment Policy Statement* (DoE, 2011) is intended to provide practical guidance to school managers and educators for planning and teaching to meet the needs of a diverse range of learners. This document incorporates the Curriculum and Assessment Policy Statement (CAPS) and forms part of the CAPS orientation programme for educators and education officials. Curriculum differentiation, which Boliver (2011) refers to as ―education shaped differently for different learners‖, is fundamental to the implementation of inclusive education in the intermediate phase mathematics classroom. This is because most learners are excluded due to a one-size-fits-all approach to following and teaching the curriculum.

2.4.2 The intermediate phase in the South African inclusive education environment

The intermediate phase falls between the foundation and senior phases, and consists of three grades — Grade 4, Grade 5, and Grade 6. It is an important transitional phase between the foundation and senior phase (Mahlo, 2011). In the intermediate phase, learners between the

ages of 10 and 14 are catered for, and they are taught seven subjects: their Home Language (HL), their First Additional Language (FAL), mathematics, life skills, social sciences, natural sciences and technology (DBE, 2011). In the foundation phase, they were taught only four subjects. Learners are also taught by multiple educators, compared with two educators in the foundation phase.

Learners also start using English as the language of learning and teaching (LoLT) in these grades. The new content subjects are taught in English by different teachers, unlike in the foundation phase, where learners are taught by a single teacher in their home language. Many learners therefore begin to experience a sense of exclusion in the classroom, based on the barrier to learning created by the LoLT being their FAL, after being taught in their home language for three years. This language barrier is experienced in conjunction with an increase in the volume and complexity of the syllabus.

2.4.3 The state of mathematics teaching and learning in the South African inclusive education environment

2.4.3.1 Annual National Assessment mathematics statistics for 2012–2014

The Annual National Assessment (ANA) in South Africa is a testing programme that requires all schools in the country to conduct the same grade-specific language and mathematics tests for Grades 1 to 6 and Grade 9 (Pennington & Richards, 2016). The ANA was introduced in 2011 as a means of assessing learning in language and mathematics. Van der Berg (2015, p. 28) states that although ―problems related to the calibration and inter temporal and inter-grade comparability of ANA test scores limit their usefulness for measuring learning gains […] relative performance in these tests provides meaningful information on the evolution of learning gaps between children‖. Table 2.3 indicates the very low average mathematics scores for the intermediate phase (Grades 4–6), and paints a clear picture of the difficulties faced by learners in the intermediate phase mathematics

classroom. In Grade 6 there has been a large increase in the percentage of learners achieving acceptable levels in mathematics over the period; however, the overall achievement level is still too low, and the overall goal of the DoE (60%) has not been achieved.

Table 2.1: Average mathematics scores in Annual National Assessment for 2012–2014

	2012	2013	2014
Grade 4	37%	37%	37%
Grade 5	30%	33%	37%
Grade 6	27%	39%	43%

(Source: Department of Basic Education, 2014, p 8)

The urgency of the situation becomes even clearer when one focuses on the percentage of learners who achieve at least 50% in mathematics in the ANA, shown in Table 1.2 below. Results are only available for Grades 3, 6 and 9, and the appallingly low statistics for Grade 9 in particular indicate the overall failure of the system of teaching and learning in mathematics classrooms in South Africa. It is clear that learners are encountering gaps in their knowledge and are falling behind during the earlier grades, and by the time they reach Grade 9, the problem of understanding mathematics has become insurmountable.

Table 2.2: Percentage of learners obtaining at least 50% in mathematics

	% learners obtaining 50% in Mathematics		
	2012	2013	2014
Grade 3	36%	59%	65%
Grade 6	11%	27%	35%
Grade 9	2%	2%	3%

(Source: Department of Basic Education, 2014, p. 9)

Learner results in the intermediate phase in general show wide-ranging deficiencies in basic knowledge, and learners' achievement deteriorates sharply over the course of the intermediate phase and into the senior phase. In order to improve learning of mathematics knowledge and skills, and to identify and address specific deficiencies revealed by the assessment results, educators must have full mastery of the mathematics content area as well as a thorough understanding of the specialised nature of the subject (Moloi & Kanjee, 2018).

2.4.3.2 Mathematics tasks in home language instead of first additional language (FAL)

In the 2015 TIMMS (Trends in International Mathematics and Science Study), South Africa came second to last in both sets of results (Grade 4 and Grade 8) (Mullis, Martins, Foy & Hooper, 2016). Research suggests that the learners' home languages are a resource in the teaching and learning of mathematics, and teaching mathematics using both their home language and the LoLT (if it differs from their home language) can improve learner results. Howie (2004) argues strongly that improvement in their English language proficiency will improve the mathematics performance of African learners. Significantly, TIMSS (2011) indicates that learners in Japan generally show high achievement levels, and learners' LoLT in Japan and their home language are one and the same.

2.5 IMPLEMENTING INCLUSIVE EDUCATION

Prior to the 1994 general democratic elections, the system of education in South Africa used to be a dual system comprising mainstream education and special education. Kisanji (1999) describes how the special education component introduced several educational problems. The perception was created that learners who required special education had something

wrong with them, and needed a curriculum that was different from that of their peers because they had difficulty in completing the standard school curriculum. Furthermore, the assessment procedures had the effect of labelling and categorising learners, with a resulting negative effect on the learners‘ self-esteem, and on teacher and parent expectations of them. Carrim (2002) explains how this dual education system resulted in many learners being excluded from mainstream education, and how the majority of these were black learners. Learners were therefore not only being segregated on the basis of learning disability, but also on the basis of race.

Since the 1994 Salamanca Statement the South African government has promulgated various Acts and policies that promote the inclusion of learners with special needs in education: Education White Paper No.1 (1995); the South African Schools Act (1996); and Education White Paper No.6 (2001). In 1997, the National Commission on Special Needs Education and Training (NCSNET) and the National Committee for Education Support Services (NCESS) were set up to investigate and make recommendations on special needs and support services in education and training in South Africa (Engelbrecht, Green, Naicker & Engelbrecht, 1999).

The success or failure of executing inclusive educational policy and practice is dependent upon what the classroom educator believes about such initiatives (Monsen, Ewing & Kwoka, 2014). However, Polat (2011) explains that ―teachers need a robust personal commitment towards inclusive practice for this intervention to be successful‖. However, South African educators do not have an adequate or detailed understanding of what inclusive education is (Ntuli & Traore, 2013). Many educators believe that integrating learners with special needs allows these learners to learn a lot from the mainstream learners, while teaching the learners without disabilities how to relate to those with special needs (Ntuli & Traore, 2013).

But most importantly, formal support structures for educators are not as effective as those proposed by policy and by the educational authorities (Nel, Krog, Mohangi, Muller & Stephens, 2016). Many educators lack the necessary skills to implement inclusive education practices due to inadequate knowledge, inadequate practical resources, and inadequate

support from principals and school authorities. It is therefore vital that principals be prepared for the implementation of inclusive education.

2.6 MATHEMATICS IN THE INCLUSIVE ENVIRONMENT

"Everybody is a genius. But if you judge a fish by its ability to climb a tree, it will live its whole life believing it is stupid" (Albert Einstein, 1999).

2.6.1 The nature of mathematics

The DBE's 2011 Grades 10–12 CAPS mathematic document (DBE, 2011, p. 8) describes mathematics as

> a language that makes use of symbols and notations to describe numerical, geometrical, geometric and graphical relationships. A human activity involves observing, representing and investigating patterns and qualitative relationships in physical and social phenomena and between mathematical objects themselves. Mathematics helps the developmental process that enhances logical and critical thinking, accuracy and problem-solving that will contribute in decision making.

Naude and Meier (2014) describe mathematics as the story of how we organise our everyday lives to make sense of what is going on around us. It explains the actions the people around us and translates our thoughts to the people around us (Naude & Meier, 2014).

According to Bowie and Reed (2016) teachers need a deep, connected and flexible understanding of the mathematical content that they are expected to teach. The intermediate phase (Grades 4-6) mathematics includes the basic operations covered in the foundation phase (Grades 1-3) and forms a critically important phase in which the majority of learners in South Africa move from learning in their home language to using English as the main LoLT (Bowie & Reed, 2016). In these grades they are also expected to move from proficiency in arithmetic, based on counting, to proficiency in using more sophisticated

mathematical tools (Bowie & Reed, 2016). Figure 2.1 shows Bowie and Reed's (2016) five components of mathematics proficiency.

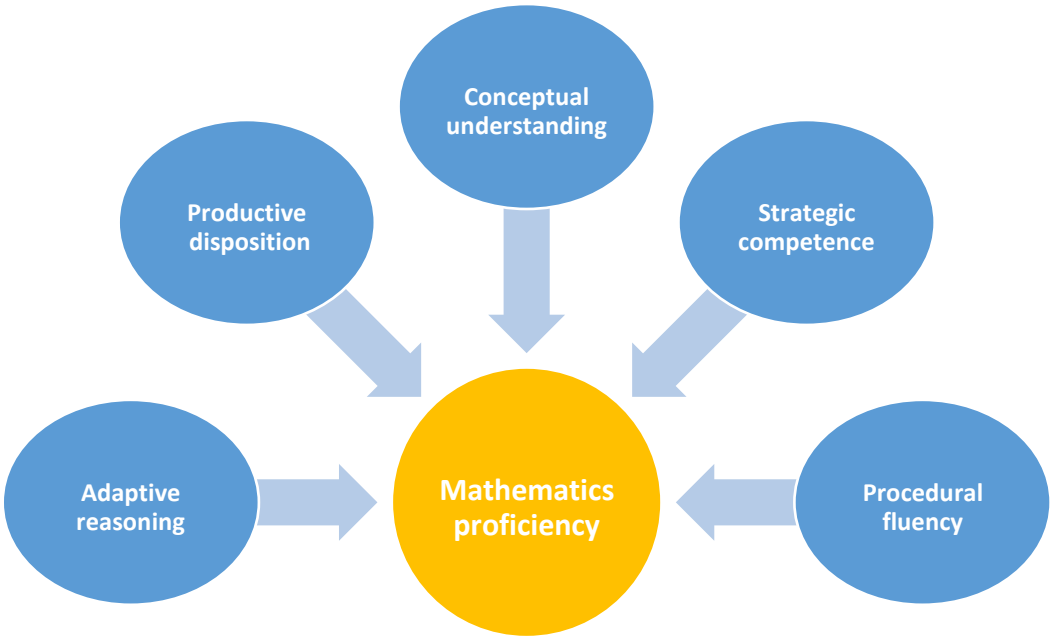

Figure 2.1: Five components of mathematics proficiency
Source: (Bowie & Reed, 2016)

2.6.2 Mathematics content areas in the intermediate phase

Mathematics content areas in the intermediate phase are as follows:

Table 2.3: Content areas for Grade 4, Grade 5 and Grade 6

Content areas	Grade 4	Grade 5	Grade 6
Numbers, Operations & Relationship	50%	50%	50%
Patterns, Functions and Algebra	10%	10%	10%
Space & Shape (Geometry)	15%	15%	15%
Measurement	15%	15%	15%
Data Handling	10%	10%	10%

	100%	100%	100%

Source: (DBE, 2011)

2.6.3 Mathematics anxiety

Mathematics anxiety is defined as ―feelings of tension and anxiety that interfere with the manipulation of numbers and solving mathematical problems in a wide variety of ordinary life and academic situations‖ (Richardson & Suinn, 1972, p.551, in Haciomeroglu, 2017). Haciomeroglu (2017, p. 59) observes that ―mathematics can be a rich context through facilitating connections to real life examples but for those who are not mathematically inclined, encouraging these connections may be overwhelming‖. Furthermore, ―although learners often begin their schooling with a positive attitude towards mathematics, mathematical experiences gained in school play a detrimental role in learners' anxiety and attitude towards mathematics‖ (Haciomeroglu, 2017). Learners often experience anxiety when mathematics is associated with assessment and problem solving. Such an anxious and negative attitude towards mathematics has negative implications for learners' academic performance in school.

According to the National Council for Teachers of Mathematics (NCTM) (2014), educators should do the following to counteract mathematics anxiety in their learners:

- Establish mathematics goals to focus learning.
- Implement tasks that promote reasoning and problem solving.
- Use and connect mathematical representation.
- Facilitate meaningful mathematical discourse.
- Pose purposeful questions.
- Build procedural fluency from conceptual understanding.
- Support productive struggle in learning mathematics.

2.6.4 Ensuring inclusivity in mathematics

Naude and Meier (2014) argue that the classroom must be a place where learners will trust that it is safe to express their feelings. Language must be used to create a classroom environment where learners and teachers respect each other. Learners must first believe that they are valued before they can value others and learn from them. Furthermore, in most South African schools the LoLT in the intermediate phase is English, creating a communication barrier between learners and educators who do not share the same linguistic background and who have little knowledge of the language communities from which the other comes (Naude & Meier, 2014).

Most importantly the best way for learners to learn in the inclusive mathematics classroom is for educators to organise and plan appropriate experiences so that learners will be able to individually construct mathematical meaning, regardless of their diversity. Educators should plan their lessons for learners with barriers to learning with the same dedication that they plan lessons to challenge stronger learners. Learners should also work collaboratively with other learners to solve mathematical problems, guided by open-ended questions set by the educator. Mathematical activities must be learner-centred rather than teacher-centred. Teachers should prioritise a classroom environment in which learning is accessible to all learners (Bond & Chernoff, 2015).

Inclusion in mathematics requires an educator to alter the learning plan of each individual learner to maximize the likelihood they can participate in classroom activities according to their own ability (Sharma & Nuttal, 2016). Ollerton (2009) further affirms that inclusivity can be ensured by using outdoor games when teaching mathematics. Recreational, out-of classroom activities can be used as learning context which learners could relate to and use and apply within their mathematics lessons. Engaging mathematics for all learners includes using the playground, dance, fashion and architecture as context for learning mathematics (Ollerton, 2009). Inclusive education in mathematics is possible when teaching, using resources the learners are familiar with. Learners need to take an active role to develop their mathematical thinking skills through engaging with rich mathematical tasks. It also reveals

that reduction of textbook activities can promote inclusion in mathematics because they will do activities within their context.

Tan (2017) argues from personal experience that promoting inclusive mathematics education has mostly met with staunch resistance on the part of the educators. Pinel (2017) recommends that teaching geometry (mathematics) in inclusive education should be done by using visually rich, tactile media to move together from simple beginnings to build a firm trust-based relationship with the learners, who are themselves empowered to arrive at a cleaner and deeper understanding of their own outcomes.

Angelova (2014) agrees to a novel way of teaching mathematics also in an inclusive education classroom setting as she proposes a system of exercise which focuses on targeted building of combinatorial competences in students. This provides opportunities which are anchored in a structured learning content and the appropriate set of problems with their methodological developments for build-up and deepening of logical knowledge to students in primary school age.

Globally and nationally, departments of education have implemented inclusive education in schools as one of the policies in ensuring quality education for all. However, the success of the implementation was completely dependent on the educator. An educator is always considered the key person in the implantation of inclusive Education (De Boer, Pijil & Minnaert, 2011). De Boer et al. (2011) attest that inadequate training and support offered to educators has resulted in the failure of inclusive education. Therefore, with continuous support and capacity building workshops, educators would be better equipped to face the challenges presented by inclusive education. Ultimately the educator plays a pivotal role, with support and liaising with other stakeholders within the school environment. De Boer et al. (2011) is of the opinion that educators thus face the greatest liability and responsibility for implementing inclusive education, since the educator is the one who has direct contact with the learners.

Practices that foster inclusion in the mathematics classroom include:

- Focusing on learner's ideas and valuing their contribution in order to minimise misconceptions.
- Describing mathematics concepts using the simple language and example from their own context.
- Helping learners to create their own mathematical identity and their own ways of solving mathematical problems.
- Sharing the authority of mathematics and setting tasks that promote reasoning and problem solving. Rote learning should be minimised at all cost.

2.6.5 Assessment practices

Shohamy (2014) cited by Pennington and Richards (2016) defines assessment as any procedure or activity that is used to measure the attitude, skills and knowledge of learners in schools. This is supported by Hanna and Dettmer (2014), who state that assessment is a process of gathering data used by instructors about their teaching and learning in their learners. This will assist in the evaluation of learners' performance. According to Roos (2018), assessment in the mathematics classroom can be a concept with broad boundaries. This means it can be done in different ways, for example through tests, through documentation such as written individual action plans, or through communication between the teacher and the learner during day-to-day work. Assessment is an activity that has strong connections between learning and teaching (Roos, 2018).

2.6.6 Curriculum differentiation

Differentiation refers to education shaped differently for different students (Bottge, Cohen & Choi, 2018). The goal with differentiation is to fit the education to all learners, and since the students are different, the education needs to be different. Another term used in relation to differentiation in mathematics is ability grouping. When using ability grouping, learner's ability in mathematics is assessed and the learners are divided into different ability groups.

2.7 AN OVERVIEW OF CONSTRUCTIVIST THEORY

In this study, constructivist theory was employed to assess inclusive education practices in the intermediate phase mathematics classroom. This theory was suggested by the Russian psychologist, Lev Vygotsky, who advocated the learning theory that maintained that our specific mental structures and processes can be traced back to our interactions with others (Woolfolk, 2007). The rationale for choosing this theory was that Vygotsky constructivist approach resonates strongly with inclusive practices in general, and with mathematics teaching in particular.

Walqui (2006, p. 160) sums up the core ideas of Vygotsky's learning theory as follows:

- Learning precedes development.
- Language is the main vehicle (tool) of thought.
- Mediation is central to learning.
- Social interaction is the basis of learning and development. Learning is a process of apprenticeship and internalisation in which skills and knowledge are transformed from the social into the cognitive plane.
- The Zone of Proximal Development (ZPD) is the primary activity space in which learning occurs.

Constructivist theory underlines how context contributes towards learning and development. The LoLT, the learning environment, and the social environment are therefore seen as critical elements in successful teaching and learning. Kussumua (2007, p.14) defines constructivism in the following way: ―Constructivism is a theory based on observation and the scientific study of how people learn and further states that people construct their own understanding and knowledge of the world through experiencing things and reflecting on those experiences‖.

Constructivists argue that teachers cannot impart knowledge to learners, and that learners learn only through engaging in activities that promote discovery. Stiff (2001) points out that a constructivist approach requires learners to be actively involved in their knowledge and be free to use their own strategies to learn. Learners construct their knowledge best when it

is socially embedded in their social contexts, and different forms of interactions should therefore exist in the classroom (Stiff, 2001). Stockall (2013) advocates peer– assisted learning, where learners are grouped together, assigned roles, and guided by the facilitator. Neo and Neo (2009) agree that learners in a constructivist learning environment work together in a collaborative manner with the teacher who fills the role of the facilitator. As a result, this method encourages collaboration, social engagement and the opportunity to listen to multiple perspectives. Pillay (2004) describes how during integration and sharing in the social context, daily concepts are integrated into relational concepts.

Most constructivists agree on the need to foster interactions between students' existing knowledge and new knowledge and experience (Haruthaithanasan, 2010). Jensen (1998) points out that constructivism is based on the fundamental principle that people create knowledge from the interaction between their existing knowledge or beliefs and new ideas. Constructivist theory therefore resonates with mathematics teaching in particular, because learning in mathematics is a scaffold process of iterations, with lessons generally beginning with a recap of previous knowledge. The link between new knowledge and existing knowledge is strongly emphasised. Loyens, Rickers and Schmidt (2009) concur that learners learn by comparing new information with prior knowledge and revising existing thought structures. In primary mathematics education, this is a necessary process for bridging the gap between concepts in the foundation phase and intermediate phase.

Diaz (2017) states that constructivism is a learning theory that describes the process of knowledge construction which is essential in ensuring inclusion in the mathematics classroom. The construction of knowledge is an active process, not a passive one (Major & Mangope, 2012). Mathematical learning based on a constructivist approach provides the knowledge that is not only stored in the minds of learners, but actively builds new knowledge. Most importantly, effective learning of mathematics requires that learners understand that what they know is connected to what they are learning, and this motivates them to learn more.

According to constructivist theory the focus of education is not content but process, so educators need to know their learners to organise this process (Mattar, 2018). Anderson

(2016) points out that all forms of constructivist theories share the understanding that individuals' construction of knowledge is dependent upon individual and collective understandings, backgrounds and proclivities. Stiff (2001) asserted that constructivism addresses the role of the teacher and learner in order for learning to take place. A constructivist approach requires active participation from the learners in constructing their own knowledge. Moreover, learners must be free to use their own strategies to learn (Stiff, 2001).

Above all this theory emphasizes that barriers to the learning of mathematics can be cultural in nature (Larvor & Francois, 2018), and that the LoLT, and the social and physical environment in which teaching and learning takes place, can determine the quality of learning outcomes.

2.8 CONCLUSION

This chapter has defined inclusive education, and has discussed literature relevant to inclusive education, the intermediate phase in the inclusive environment, inclusive practices within this phase and within the mathematics classroom, assessment practices within the inclusive classroom, and general issues related to the implementation of inclusive education in the global and the South African context. In addition, it has provided an overview of constructivist theory, which forms the theoretical approach to this study and underpins the data analysis.

It is clear that as the key providers in the education system, educators face many challenges in implementing inclusive practices in the intermediate phase mathematics classroom.

The following chapter discusses the methods that were used to collect data for analysis. It deals firstly with the overall research paradigm that informed the approach to data collection and analysis (the research philosophy, approach and purpose), and then describes the overall research design (the research strategy employed, the research setting, the sampling procedure and the data collection procedure). The data analysis is then described, as well as the methods used to ensure trustworthiness in the data, the limitations of the study, and the ethical considerations that were taken into account.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

The previous chapter examined the literature relevant to inclusive education, particularly in relation to the intermediate phase in the inclusive environment, inclusive practices within this phase and within the mathematics classroom, assessment practices within the inclusive classroom, and general issues related to the implementation of inclusive education. In addition, it provided an overview of constructivist theory, which underpins the data analysis of this study. This chapter discusses the methods that were used to generate data for analysis. It deals firstly with the overall research paradigm that informed the approach to data collection and analysis (the research philosophy, approach and purpose), and then describes the overall research design (the research strategy employed, the research setting, the sampling procedure and the data collection procedure). The data analysis is then described, as well as the methods used to ensure trustworthiness in the data, the limitations of the study, and the ethical considerations that were taken into account.

These components form the research methodology of this study, which Rajasekar, Philominathan and Chinnathambi (2013) describe as a logical framework that a researcher uses to describe, understand, explain and predict a particular phenomenon. According to Creswell (2003) ―methodology is the description of a process, which can expand to including an academically clear collection of theories, concepts or ideas as they relate to a particular discipline or field of enquiry. Rouzies (2014) describes research methodology as a broad approach to scientific inquiry that determines how research questions should be asked and answered, and includes decisions regarding research design, sampling, data collection, analytical strategies, guidelines for drawing conclusions, and criteria for assessing the research problem and providing recommendations. It is important, however, to distinguish between methodology and methods. Troudi (2010) states that while

methodology refers to the overall research strategy, and generally demonstrates specific philosophies, theories or approaches to gathering and producing knowledge, a method refers to a particular technique or instrument used to collect data.

3.2 RESEARCH OBJECTIVES

The aim of this study was to assess inclusive education practices in the intermediate phase mathematics classroom from the perspective of the educators. The study was guided by the following primary research objectives:

1. To evaluate the educators' perceptions and practices of inclusive education in the intermediate phase mathematics classroom.
2. To understand strategies that can be employed to enhance and promote inclusive education practices in the intermediate phase mathematics classroom.
3. To provide recommendations on how inclusive education practices can be improved in the intermediate phase mathematics classroom.

The following sections outline the research paradigm and research design that guided the researcher in achieving these objectives.

3.3 RESEARCH PARADIGM

Taylor and Medina (2013) describe a paradigm as ―a comprehensive belief system, worldview, or framework that guides research and practice in a field‖. The researcher's philosophical views, approach to the research, and general research purpose constitute the research paradigm, and these aspects have a significant impact on how knowledge is studied and interpreted (Mertens, 2005 in Munyoro, 2014). According to McKenna (2010) cited in Mhlolo (2011), a research paradigm reflects the researcher's views on how knowledge is constructed, and ultimately the researcher's perceptions on what counts as truth.

For the purpose of this study, the research paradigm is broken down into three aspects: the research philosophy, research approach and research purpose. The aim of this study was to explore inclusive education practices in the intermediate phase mathematics classroom from the perspective of the educators. The guiding research philosophy used to investigate these perspectives was an interpretivist philosophy, grounded in a social constructivist world view underpinned by the work of Vygotsky (Woolfolk, 2007). A qualitative research approach was used to construct the investigative interpretivist framework, and the overall research purpose can be described as exploratory. The three aspects of the research paradigm are described in the following sections.

3.3.1 Research philosophy

Because this study intended to explore the views of educators in relation to their perceptions and practices of inclusive education in the intermediate phase mathematics classroom, the focus was an in-depth interpretation of the perceptions and behaviours of a small group of participants. Consequently, an interpretivist philosophy was employed (Basit, 2010 cited in Taweechaisupapong, 2015). The interpretivist paradigm is widely employed in qualitative research (Creswell & Poth, 2017, p. 8), and is based on the presumption that individuals look for understanding of the world in which they live and work. It involves subjectivity, and is therefore compatible with the constructivist worldview, which sees the world as socially built.

3.3.2 Research approach

There are two basic approaches to investigating a research problem: the quantitative approach and the qualitative approach (Kothari, 2004, p. 5). However, in this study, I adopted a qualitative approach. A qualitative approach is concerned with a more subjective evaluation of subjective information, and has the potential to be influenced and affected by the researcher‘s own experiences, knowledge, insights and impressions. Common research

techniques in qualitative research are those that gather subjective information from participants, such as focus group interviews, questionnaires with open-ended questions, key informant interviews and in-depth interviews. Because this study explored the views of educators in relation to their perceptions and practices of inclusive education in the intermediate phase mathematics classroom, the researcher sought to gather qualitative information from the participants relating to their experiences and opinions.

For the purpose of this study a qualitative research design was used. White (2013) explains that qualitative research is more concerned with understanding social phenomena from the perspective of the participants. Above all this method was suitable to answer the research questions which aimed at exploring teachers' perceptions about inclusive education in the intermediate phase mathematics classroom.

Qualitative research methodology allows the researcher to study selected issues in depth, openness and details as they identify and attempt to understand the categories of information that emerge from the data (Terre Blanche, Durrheim and & Painter, 2009). Therefore, in qualitative studies there is an established set procedures and steps that guide the researcher (White, 2013, p.6). The researcher becomes part of the situation, present or past, and the phenomenon being studied. In qualitative studies an experimental or correctional design can be used to reduce error, bias and the effect of extraneous variables.

The study was designed within the qualitative research paradigm because the goal was to explore Inclusive Education Practices in the Intermediate Phase Mathematics Classroom. The qualitative data-gathering methods used in this study could be a valuable tool for gathering feedback from the teachers for purpose of curriculum evaluation, although qualitative research methods have restrictions (Victoroff & Hogan, 2006).

Finally, qualitative designs are just as systemic as quantitative designs, but they emphasize data on naturally occurring phenomena. Most of these data are in the form of words rather than numbers, and the research must search and explore with a deep understanding which is achieved (McMillan & Schumacher, 2010, p.23).

3.3.3 Research purpose

Research purpose refers to the goals of the research. According to Saunders et al. (2007, p. 139), there are three types of research study: exploratory, descriptive and explanatory. This study can be characterised as exploratory, because the researcher intended to look for new perspectives into the practice of inclusive education in the mathematics classroom, and intended to conduct a preliminary inquiry into the phenomenon in a context where this phenomenon has not been well researched (at under-resourced primary schools in KwaZulu-Natal, South Africa. The findings obtained through exploratory studies are not typically generalisable to the population at large.

3.4 RESEARCH DESIGN

The research design allows for important decisions to be made, such as type of data that needs to be retrieved, the instruments to be used, the appropriate selection of participants and the manner of analysing the findings (Hancock, Ockleford & Windridge, 2009). The research design for this study is broken down into the research strategy, the research setting, the sampling procedure, and the data collection procedure. These aspects are discussed in the following sections.

Punch (2006) defines a research design as the basic plan for a piece of empirical research and it includes five main ideas: strategy, conceptual framework, who or what will be studied and the tools and procedures for data collection and analysis. Leedy (1993) asserts that research design entails planning, visualizing of data and the employment of this data in the research project. Punch (2006) alludes that a design connects the research questions, the data production procedure and the final data produced.

3.4.1 Research strategy

Saunders et al. (2007, p. 140) identify different types of research strategies, such as experiments, surveys, case studies, action research, grounded theory, ethnography, and archival research. This study adopted a case study strategy, as described by Saunders et al. (2007, p. 140) and Yin (1994), cited in Munyoro (2014). The case study strategy was chosen because it is suited to the qualitative investigation of a specific situation (in this case the experiences of intermediate phase mathematics educators in an inclusive environment) in its real-life context.

Yin (1994) cited in Munyoro (2014) describes a case study as an empirical inquiry in which the focus is on a contemporary phenomenon within its real-life context. The objective of the case study is usually to investigate the dynamics of a single bounded system, typically of a social nature, such as a family, group, community or participants in a project (Welman, Kruger & Mitchell, 2005). In a case study, a particular individual, programme, or event is investigated in depth for a pre-defined period of time in a real-life setting (Leedy & Ormrod, 2010). Data is collected using a combination of interviews, personal observations, and internal or external documents (Bhattacherjee, 2012).

Bhattacherjee (2012) observes that as a research strategy, the case study offers a richness and depth of information that is difficult to obtain by other methods, and is able to uncover a wide variety of social, cultural, and political factors potentially related to the phenomenon of interest that may not be known in advance. In summary, a case study strives to understand one person or a situation in great depth (Mahlo, 2011). The major strength of the case study method is the flexibility to utilize multiple sources and techniques in the data-gathering process (Maree, 2014). The goal of this study was not to generalise the findings but to gain an in-depth understanding of the research questions by exploring the educator's perceptions and practices of inclusive education in the intermediate phase mathematics classroom.

3.4.2 Research setting

The study was conducted at three primary schools located in KwaMakhutha, an urban area under Umbumbulu tribal authority in KwaZulu-Natal, South Africa. The schools are in Mafa ward, 30 kilometres south of Durban. The area has an estimated population of 24 336, consisting largely of Zulu-speaking black South Africans. Crime and unemployment are high, and the school is surrounded by RDP (Reconstruction and Development Programme) houses. 80% of the population depends on old age pensions or social grants, and are from poor socio-economic backgrounds. The area has a limited number of play areas, and popular sports are soccer and netball. Alcohol and drug abuse is prevalent, and there is a high rate of teenage pregnancy. There is only one FET College in the area, three high schools, nine primary schools, one clinic and one library. The primary schools cater for Grade R to Grade 7. The schools are quintile 3 and 4 with an enrolment of 943 learners or more, and the learners benefit from school nutrition programmes.

3.4.3 Sampling

Sampling refers to the elements in the population considered for inclusion in the study (Mahlo, 2011). Furthermore, there are different kinds of sampling techniques like Purposive sampling techniques also known as judgemental sampling; it is the deliberate choice of participants due the qualities the participant possesses.

The study used convenience sampling to select participants (Braun & Clarke, 2006). It is also known as Haphazard Sampling or accidental sampling. Convenient sampling is used because the researcher had the limited time and resources due to budget constraints. It is affordable, easy and the subjects are readily available (Etikan et al., 2016). Convenience sampling was employed to select schools that were situated in the area where I am teaching. It was convenient because I travelled short distances to get to these schools.

3.4.3.1 Population

Babbie (2011) defines the population of a study as the group about whom the researcher wants to draw conclusions. Welman et al. (2005) concur that the population encompasses the total collection of all units of analysis about which the researcher wishes to make specific conclusions. Population is defined much more simply by Brynard and Hanekom (2006, p. 55) as ―a group in the universe which possesses specific characteristics‖. The target population for this research study was intermediate phase primary school teachers who are teaching mathematics in schools in the Umbumbulu circuit.

3.4.3.2 Sampling strategy

Sampling refers to the elements in the population considered for inclusion in the study (Mahlo, 2011). The study used purposive sampling, also known as judgement sampling, to generate data (Etikan, Musa & Alkassim, 2016). It is a type of non-probability or non-random sampling, where members of the target population meet certain criteria that make them suitable for inclusion in the study. They may be easily accessible, located nearby, available at a given time or willing to participate in a study. Purposive sampling involves the deliberate choice of a participant due to the qualities the participant possesses‖ (Etikan et al., 2016, p. 2). In this study, I purposefully selected eight intermediate mathematics teachers from three primary schools because my study focused on inclusive teaching in mathematics.

3.4.3.3 Sample

The research participants were conveniently located in the three primary schools in Umbumbulu circuit. They were selected for participation because they are mathematics teachers in the intermediate phase (Grade 4 to Grade 6), and were therefore likely to provide relevant information that would assist the researcher in achieving the aim and objectives of the study. They all had two or more years' teaching experience, and two of the participants in particular were highly experienced, with 12 and 22 years' experience. All participants had two or more years teaching mathematics in the intermediate phase, with

half of them having significant experience (8, 9, 10 and 15 years ‘experience). The participants were therefore judged to have sufficient experience to provide useful and relevant responses to the interview questions and questionnaire, which could inform answers to the research questions of the study. The participants were all passionate about teaching mathematics, and wished to see an improvement in effective teaching and learning in their classrooms, and in their learners’ results. The sample consisted of three males and five females, all of whom were professionally qualified and were currently teaching at the three primary schools. Table 3.1 illustrates the profiles of the research participants.

Table 3.1: Profile of participants

Name of Participant	Gender	Qualifications	Teachers’ experience in a phase	Number of years teaching mathematics
Participant 1	Male	Honours degree	3	3
Participant 2	Female	SPTD	12	4
Participant 3	Male	Master‘s degree	5	2
Participant 4	Female	SPTD	4	4
Participant 5	Male	SPTD	22	15
Participant 6	Female	JPTD	2	8
Participant 7	Female	HED	7	10
Participant 8	Female	BED	5	9

3.4.4 Data generation methods

Data generation is the mechanism used by researchers to gather relevant information to answer their research questions, to form conclusions, and to defend their conclusions and recommendations (Mertens, 2011). Terre Blanche and Durrheim (1999) and Naidoo (2010) views data collection as one of the most important phases in a research project, as it is during this phase that researchers gather their basic material.

3.4.4.1 Research instruments

Data was generated using structured interviews (see Appendix F) and questionnaires (see Appendix G). One-on-one structured interviews were conducted with the participants, in order to obtain additional information from body and facial expressions (Munyoro, 2014). The interviews were audio taped so that the researcher could also note other non-verbal responses, such as inflections or tone of the voice, and to use to create a verbatim transcript for analysis (Verma & Mallick, 1999). The questionnaire consisted of open-ended (qualitative) questions (Mayaba, 2008).

3.4.4.2 Data generation procedure

Data was generated over a two-month period (August to September). Prior to the commencement of the study, ethical clearance was granted by the University of KwaZulu-Natal (see Appendix B), and permission to conduct the study was sought from the DoE (see Appendix A) and the principals of the schools concerned (see Appendix C). The purpose of the study was explained to the prospective participants when permission was granted by the principals, and willing participants were then asked to read and sign informed consent forms before participating in the study (see Appendix D). These forms explained that participation was voluntary, and that participants were free to withdraw from the study at any time. Permission to audio tape the interview was also requested from the participants.

In generating data for this study, firstly, the researcher explained the nature of the study to the participants. In addition, the researcher issued questionnaires to the participants in which they had to complete (see Appendix G). The researcher gave participants a period of three weeks to complete the questionnaires. During this phase, participants were also given interview questions because the researcher wanted to administer interviews after the participants had completed the questionnaires.

Secondly, the researcher administered interviews with participants. During the interviews, an interview schedule was used to record the responses (see Appendix F). Creswell (2012) describes the interview protocol as a form designed by the researcher that contains

instructions for the process of the interviews, the questions to be asked, and space to record the participants' responses. Recordings of the interviews were also transcribed.

3.5 DATA ANALYSIS

Data analysis is ―a systematic process of selecting, categorizing, comparing, synthesizing and interpreting data to provide explanations of the single phenomenon of interest‖ (Mayaba, 2008). Qualitative data analysis focuses on how participants ―make meaning of a specific phenomenon by analysing their perceptions, attitudes, understanding, knowledge, values, feelings and experiences in an attempt to approximate their construction of the phenomenon‖ (Maja, 2015). For the purposes of this study, the researcher used thematic analysis to analyse qualitative data. Thematic analysis focuses on ―identifiable themes and patterns of living and behaviour‖ (Aronson, 1995) and is ―a method for identifying, analysing and reporting patterns or themes within data‖ (Mayaba, 2008).

To conduct a thematic analysis, data must be organized in such a way that it ―makes sense in terms of the participants' definition of the situation, noting patterns, themes, categories, and regularities‖ (Madihlaba, 2013). To analyse the data collected, this study used Braun and Clarke's (2006) method of thematic analysis, which they describe as ―a qualitative method for uncovering a collection of themes, some level of patterned response or meaning‖ (Braun & Clarke, 2006, p. 86) within a data set.

The six steps that Braun and Clarke (2006) use to conduct thematic analysis are as follows:

3.5.1 Step 1: Become familiar with the data

During data generation, the researcher familiarized herself with the context of the interviews and took notes, and also started to map possible recurring concepts that could be used to create thematic codes (Braun & Clarke, 2006). The data generation already started to become an interpretive act (Lapadat & Lindsay, 1999), rather than a simple recording of responses. During the transcription process, the researcher engaged with the data from the

audio recording and ensured that all the information from the audio recording was transcribed and remained as original as possible; the researcher also translated isiZulu words into English. After the interviews and questionnaire responses had been captured, the researcher read and re-read the data, to become immersed and intimately familiar with its content.

Bird (2005) emphasizes the importance of a deep engagement with data obtained from interviews, even though this process may seem time consuming. Riessman (1990) explains the importance of the researcher becoming familiar with the data prior to the thematic analysis. This can improve the quality of the transcript, as the researcher will be more aware of ways in which it may have been deliberately or accidentally altered (Poland, 1995).

3.5.2 Step 2: Generate initial codes

Braun and Clarke (2006) define coding as ―an interpretive process of assigning meaning to raw data in order to classify, identify or organize data into meaningful groups‖, and as ―the building blocks of analysis‖ This step requires the researcher to identify important elements of the data that might be relevant to answering the research questions, and to then label (code) them. Some codes are described or labelled using the participants‘ own language and concepts, while others may be identified and labelled using the researchers‘ conceptual and theoretical framework, when the researcher notes points of interest that relate to their background knowledge of the field of research. In this study, the researcher carefully identified elements in the data that resonated with the research questions, and coded them appropriately.

3.5.3 Step 3: Search for themes

This phase involves examining the codes and the collected data that they represent, to identify significant broader patterns of meaning (potential themes). Braun and Clarke

(2006) describe how a thematic map starts to develop as the researcher examines relationship between codes, between themes and different levels of themes. During this step the researcher studied the transcripts to identify patterns within the codes, and tried to organize them into meaningful themes for analysis.

3.5.4 Step 4: Review potential themes

Each potential theme must be reviewed to assess its viability. This phase involves checking potential themes against the dataset to check whether they fit with the overall narrative of the data, and whether they answer the research questions. Themes are refined during this phase, and are often split into multiple themes, combined into a single theme or rejected completely (Braun & Clarke, 2006). The researcher reviewed the potential themes from step 3 to check for coherence in relation to the overall data set, and refined them in various ways. The data covered within themes was evaluated to check if it was sufficient, or if participants needed to be consulted again.

The guiding questions in step 4, according to Braun and Clarke (2006) were as follows:

- Is this a theme?
- If it is a theme, what is the quality of this theme?
- What are the boundaries of this theme?
- Is the data too diverse and wide ranging?

3.5.5 Step 5: Define themes

In this step the researcher defined and further refined the themes to be used for analysis. This was done to identify core themes and sub-themes, to check again whether there was sufficient data within each theme, and to ensure that the themes were different. They could relate to each other, but not overlap (Braun & Clarke, 2006). The researcher clearly stated what was unique and specific about each theme, and used the themes to clearly connect the data to the research questions, naming each theme accordingly.

3.5.6 Step 6: Writing-up / producing the report

The final stage involved creating an analytical narrative, using the themes and the data extracts. After the themes and sub-themes had been carefully established, the researcher conducted a thorough analysis and wrote up the findings. The researcher followed Braun and Clarke‘s (2006) advice that themes be presented ―in a coherent manner, building from each other in order for the data to connect logically and meaningfully‖.

3.6 METHODS USED TO ENSURE TRUSTWORTHINESS

Guba and Lincoln (1994) explain that trustworthiness of data ―addresses issues of credibility, transferability, dependability, conformability and authenticity which in qualitative research design are equivalent to internal validity, external validity, reliability and objectivity respectively‖ (Guba & Lincoln, 1994). Trustworthiness is a method of ensuring rigour and relevance in qualitative research (Mahlo, 2011). Ensuring that one‘s data is trustworthy requires the researcher to gather data ―in a manner that is accurate, carefully recorded and interpreted by the research (the participants have to agree with the findings), and that reflects what actually happened in the interviews‖ (Stoltz, 2016).

3.6.1 Credibility

According to Guba and Lincoln (1994), credibility in qualitative research is the ability of the researcher to demonstrate ―a prolonged period of engagement with participants, to provide evidence of persistent observation, and to triangulate by using different sources, different methods and sometimes multiple investigators‖. To ensure that credibility was achieved, the researcher conducted in-depth interviews with educators who had been involved with the teaching profession for at least two years. These interviews were supported by structured questionnaires administered to the same participants, and the data

generated from both research instruments was subjected to a rigorous process of thematic analysis, analysed in section 5.

3.6.2 Transferability

The extent to which the findings can be applied to other settings and contexts is known as ―transferability‖ (Guba & Lincoln, 1994). The investigator has ensured that sufficient contextual information about the field sites has been provided to enable other researchers to determine whether the results are transferable to their particular settings and contexts.

3.6.3 Dependability

Dependability of data is ―the extent to which the same findings could be repeated if the same research instruments were simulated with similar respondents under similar conditions‖ (Mahlo, 2011). The researcher used structured interviews and questionnaires to understand the educators' experiences of inclusive education practices in the intermediate phase mathematics classroom, in an attempt to ensure dependability.

3.6.4 Conformability

Conformability refers to the extent to which findings are free from bias (Guba & Lincoln, 1994). Throughout the data collection process, the researcher kept field notes to record any factors that could potentially affect her as the researcher, such as her personal attitude and emotions, and those of the participants. The researcher examined her personal views, feelings and attitudes to determine how they could potentially influence the investigation. In this way the researcher tried to minimise bias and preconceived ideas about inclusive education practices in the intermediate phase mathematics classroom.

3.6.5 Authenticity

Authenticity refers to a true and accurate description of people, events and places (Mahlo, 2011). Qualitative research can be described as authentic if the descriptions and the explanations align. The researcher must be able to report a situation through the eyes of the participants (Mahlo, 2011) and ensure that different points of view are fairly and adequately represented (Denzin & Lincoln, 2005). The perceptions of the participants need to be understood correctly, and be accurately captured and reported (Denzin & Lincoln, 2005). The researcher used her own experiences as an intermediate phase mathematics teacher to determine an authentic position from which to interpret the participants‘ responses, while remaining mindful that she was also coming to the situation as a researcher with particular goals and requirements that needed to be satisfied without compromising the participants‘ voices.

3.7 LIMITATIONS OF THE STUDY

As mentioned in section 1.10.2, this research was limited to a small sample of educators at three primary schools in Umlazi District, KwaZulu-Natal, South Africa. The sample was restricted to only intermediate phase educators who teach mathematics within Mafa cluster of Umbumbulu circuit. The findings cannot therefore be generalised, as they apply to a limited sample group and a very specific social, political, economic and cultural context.

3.8 ETHICAL ISSUES

Leedy and Ormrod (2010) state that ethical behaviour is of critical importance in research, just as it is in any other field of human activity. According to Welman, Kruger and Mitchell (2005), ethical considerations that a researcher must consider include informed consent, and the participants’ rights to privacy and protection from harm. Denzin and Lincoln (2005) explain that in qualitative research in particular, researchers necessarily intrude into the participants‘ lives and thoughts, so they need to do so carefully, respectfully and ethically,

and it is their duty to ensure that ethical practices are conducted at all times during the research process (Denzin & Lincoln, 2005).

The participants in this study were professional teachers protected by the South African Constitution, and its Bill of Rights in particular, which protects the rights of all South Africans to human dignity, equality and freedom. At all times the researcher was mindful and respectful of their protected rights.

Prior to the commencement of the study permission to conduct the research was sought from the DoE, and permission was granted (see Appendix A). Ethical approval for the research was obtained from the University of KwaZulu-Natal‘s Humanities and Social Sciences Research Ethics Committee ((Protocol reference number: HSS/0412/018M, see Appendix B), and the study was carried out according to the ethical guidelines stipulated by the university. Permission from the school principals was also sought and granted (see Appendix C). In order to make sure that the school principals were adequately informed about the nature of the research, the researcher conducted a presentation and provided the principals with a proposal that explained the research purpose, aims and objectives.

3.8.1 Informed consent

In qualitative research informed consent is extremely important because of the personal and in-depth nature of the information being collected. Potential participants were contacted verbally and by means of a circulated letter that explained the research process (see Appendix E). Those who agreed to participate were required to read and sign an informed consent form (see Appendix D), which explained that participation was voluntary, and that their identities and the information that they shared would be kept confidential.

3.8.2 Right to privacy

The respondents’ right to privacy was guaranteed. The names of the teachers were not used, and pseudonyms (Participant A, B, etc.) were assigned to all participants to ensure

anonymity. The data was handled in compliance with the Data Protection Act of 1998, and was stored in the supervisor‘s office in a safe and lockable cabinet. Participants were given access to all the data relevant to them as individuals. The data will be discarded or shredded after five years.

3.8.3 Protection from harm

The respondents were assured that they would be protected from any physical or emotional harm. There was no physical risk involved in participating in the study, as participants were simply required to complete the questionnaire and participate in face-to-face interviews. Participants were informed that they could withdraw at any stage of the research if they felt that their rights were being violated or their lives were at risk.

3.8.4 Involvement of the researcher

A researcher should guard against manipulating respondents or treating them as objects or numbers rather than as individual human beings. They should not use unethical tactics and interview techniques. Accordingly, the researcher made a concerted and thoughtful effort was to uphold ethical considerations throughout the study. As discussed in section 3.5.4, the researcher examined her personal views, feelings and attitudes to determine how they could potentially influence the investigation, and tried to minimise any bias or preconceived ideas.

3.9 CONCLUSION

This chapter has discussed the methods that were used to collect data for analysis. It dealt firstly with the overall research paradigm that informed the approach to data collection and analysis (the interpretivist research philosophy, the qualitative approach and the exploratory purpose), and then described the overall research design (the case study research strategy employed, the research setting, the purposive sampling procedure and the data collection procedure using structured interviews and a questionnaire). Braun and Clarke‘s (2006)

process of thematic data analysis was then described, as well as the methods used to ensure trustworthiness in the data, the limitations of the study, and the ethical considerations that were taken into account.

In the following chapter the research findings from the structured interviews and questionnaire will be presented and analysed.

CHAPTER 4

DATA PRESENTATION AND ANALYSIS

4.1 INTRODUCTION

The previous chapter outlined the research design and methodology that guided this study on exploring inclusive education practices in an intermediate phase mathematics classroom in Umlazi District. The data collected is presented and analysed in this chapter using thematic analysis, and is interpreted using constructivist theory.

The research questions that guided this study were as follows:

- What are educators' perceptions of inclusive education and what are their practices in the intermediate phase classroom?
- How can educators in the intermediate phase mathematics classroom enhance inclusivity?
- How does inclusive education need to be improved in the intermediate phase mathematics classroom?

Two data generation instruments were used to generate data: scheduled interviews and questionnaires. The scheduled interviews were used to answer the three research questions, and the questionnaires were used to collect sufficient data on the knowledge and experiences of teachers who are teaching mathematics in the intermediate phase. The data generated through the questionnaires enriched the information generated from the scheduled interviews. Interviews are effective when the researcher wants to fully understand someone‘s impressions or experiences, or learn more about their answers. However, questionnaires can be flexible and convenient. The data collected using the two data collection instruments was analysed using Braun and Clarke‘s (2006) method for conducting thematic analysis, and interpreted using Vygotsky‘s constructivist theory. The findings were assessed against the extant literature discussed in Chapter 2.

The study was conducted at three primary schools. Eight educators were chosen using convenience sampling, each with three year experience or more teaching mathematics in the intermediate phase. These respondents teach in institutions where resources are lacking, and language is a barrier since the LoLT in the intermediate phase is English, as opposed to the home language in the foundation phase. The respondents complained about overcrowding in the classrooms and about how inclusive teaching practices are not properly facilitated. The findings are presented as the respondents' actual statements, and are therefore representative of the participants' voices. This is then followed by a discussion of the findings in relation to the literature reviewed and in terms of constructivist theory. In accordance with the ethical considerations taken into account in this research, the participants' identities are protected and they are referred to as participants 1–8.

4.2 ANALYSIS OF DATA

Data analysis is determined by the research questions, by multiple readings and by interpretations of the raw data (Thomas, 2003). The data analysis of qualitative data is said to be difficult but satisfying, as it identifies patterns and meaningful data from the discussions (Patton & Cochran, 2002). There are various methods of analysing data but for this study thematic data analysis was used. Thematic data involves analysing all the data, and identifying the major themes and sub-themes that emerge. The researcher read and interpreted the interview transcripts, and five main themes and sub-themes emerged from the data collected. These themes are discussed in the following section.

4.3 OVERVIEW OF RESEARCH THEMES

Five main themes emerged from this study:

1. Lack of training and skills development
2. Barriers experienced by teachers in the application of inclusive policy
3. Teachers‘ prejudices and discrimination

4. Effects of large class sizes in an inclusive environment
5. Lack of parental involvement in an inclusive classroom or community.

The sub-themes that emerged in relation to the main themes are presented in Table 4.1 below.

Table 4.1: Overview of Research Themes

Themes	Sub-Themes
Lack of training and skills development	Inadequate teacher support No clear policy at participants‘ disposal Lack of ongoing training Insufficient workshops No coaching, mentoring and monitoring Work readiness programmes
Barriers experienced by teachers in the application of inclusive policy	Limited training or no training at all Limited knowledge of novice teachers Differentiated approach Language barrier Counting skills and strategies Assessment strategies
Teachers’ prejudices and discrimination	Barriers are permanent Difficulties teaching mathematics Few learners can learn mathematics Resources are a challenge in teaching mathematics Language used in junior grade decreases learner performance Time management is a challenge when teaching mathematics
Effects of large class sizes in an inclusive environment	No individual attention Differentiated teaching is a challenge Discipline in large classes Lot of marking and delayed feedback to learners

Lack of parental involvement in an inclusive classroom or community	Supervision of homework at home is a challenge Attendance in curriculum meetings Parent teacher interviews Parents come to school due to in- differences Assignments and homework are not done at home

4.4 FINDINGS AND ANALYSIS

4.4.1 Teachers' general understanding of inclusive education in the intermediate Phase

The researcher sought to understand how teachers in the intermediate phase perceive inclusive education. Constructivist theory suggests that educators would use their understanding and knowledge to create and manage an inclusive environment. The respondent's perceptions of inclusive education in the intermediate phase were as follows.

Participant 2 saw the need for inclusive education in South Africa as being primarily an issue of scarce resources and lack of adequate provision for learners with special needs. This participant suggested that educators were obliged to include these learners because there was nowhere else for them to go:

> *My perception about inclusive education is that you have to cater for all learners, all learners with special needs in our mainstream schools since the LSEN* [learners with special education needs] *schools are very scarce and there are so many learners with special needs so we need to accommodate them in our teaching, to group them according to their abilities, so as to make our teaching and learning effective as possible.*

Participant 3 offered a thoughtful and nuanced perception of inclusive education, highlighting the importance of the educator's attitude towards inclusivity, towards various levels of barriers to learning, and towards the possibility of change, both on the part of the learners and within themselves:

I am going to speak from the heart, I am sure that you know I am speaking from the heart, my perception when I first heard about inclusive is that it is going to be very difficult to maintain a successful class and productive class with inclusive education because we look at the learners and we say that one has a special need and that one has whatever and I am not trained for that but looking at I development yengane and knowing ukuthi some of the things that we call barriers are not permanent some of them are superficial like if I do not understand some concepts of inclusive education it will be difficult to implement but if I understand the concept then it will be easy to manage your class but another thing that I can quote as well is that some of us teachers do tend to look for the easy way out so if you have got learners that are generally perceived as learners with no problems and no learning barriers that means you have a smart class that make your job easy then we will have a negative attitude towards those who have barriers whereas maybe the barrier are not barriers they are just differences, common differences where you just need to identify those differences and group them together and work with them according to their pace and their way, so my perception all lies in the teachers understanding of what inclusive is all.

Participant 5 explained that inclusive education caters for all the learners, irrespective of their background, and caters for many levels of learning ability: ―*Inclusive education is the education that aims to cater for all the learners and a learning environment that caters for many learning abilities or diverse abilities"*.

Participant 6 emphasised the learner‘s perspective and feelings, how teaching needs to be responsive to the needs of diverse learners, and how an inclusive approach reduces frustration on the part of the slower learners:

Inclusive education has to take care of both learners that are gifted and slow learners, so it is there to cater for learning ability of all types whether they are slow, good or medium, they must be accommodated for that and we can actually give the child an assessment suitable for that learner. So, I feel that inclusive education allows learners to adjust and feel less frustrated.

Both Participant 7 and Participant 8 focused on all learners being catered for in a mainstream environment. Participant 7 focused on inclusive education as a mandatory legislated requirement, and did not focus on the learners' or educators experience, while Participant 8 focused on barriers to learning.

> Participant 7: *Learners with special and without special needs receive learning instruction as per White Paper 6 speculation. The school is said to be a mainstream institution*.

> Participant 8: *Inclusive education allows all learners to be catered for in a mainstream school irrespective of their barriers to learning*.

All participants appeared to understand the general concept of inclusive education. Muringi (2015) emphasises the importance of a correct understanding of inclusive education, and states that the underlying challenge within the context of inclusive education is the inconsistency in its definition worldwide. However, the participants' general understanding was in line with Moscardini (2014) definition of inclusive education as ―a collective approach to teaching based on the idea that all children can learn together, and that participation in learning requires responses to individual differences among learners that do not depend on ability labelling or grouping or the withdrawal of the learners for additional classroom support‖. The participants showed that they understood what inclusive education entails in the intermediate phase, and they defined it as being non-discriminatory and as including all learners, irrespective of their particular barriers to learning.

A good general understanding of inclusive education as a concept is important because, as shown by Ntombela (2011), the educator is responsible for creating an inclusive environment that facilitates the learning process. Without an understanding of inclusive education, the educator will not be able to create the required learning space, thus hampering the learning process. This is in line with Vygotsky's theory of constructivism, in terms of which a child's environment would contribute towards the learning process. Constructivism, according to Diaz (2017), involves a process of knowledge construction,

and such a process on the part of educators in relation to inclusive education, is essential in ensuring inclusion in mathematics classrooms.

Teachers with a proper conceptual understanding of inclusive education can therefore provide proper support and implementation, and also resolve disagreement and confusion over inclusive education.

4.4.2 Theme 1: Lack of training and skills development

4.4.2.1 Lack of on-going training

Lack of educator knowledge due to lack of on-going training is considered to be a barrier to inclusive education. In order to achieve successful inclusion, educators need a firm understanding of inclusive education practices as well as the ability to implement appropriate inclusive strategies (Mohanty & Nanda, 2017). The majority of the participants described inclusive education as a mandatory policy whose implementation is seldom supported with the necessary skills and resources.

Participant 2 stated: ―*We attend workshops for few hours and that is not enough because there is a lot to since I am the driver of this programme*‖. Participant 3 concurred, saying: ―*No, no, no! These workshops are not capacitating me very well because it's a day workshop and I think if they can be like three days' workshop, I think I will be well capacitated and have more skills*‖. Participant 6 groaned, saying: ―*I only attend once, and this is my fourth-year teaching mathematics in the intermediate phase and even after IQMS I indicated that I need to be developed in Inclusive Education but up to now I haven't received a workshop on this*‖.

Participant 8 elaborated in some detail:

> *Uhm, in a way yes, my difficulty will be… I don't know if I should say this or not, my difficulty it will be on enough training or enough workshops around Inclusive Education. Inclusive Education requires a certain skill and without that skill, you must remember that maybe some of us come from background of Bantu Education which we look at it now and we assumed it was good and needed a little*

modification here and there. Constant training of teachers ensuring that Inclusive Education is fully implemented because implementation comes with monitoring, mentoring and support and seeing ukuthi kuyalunga yini. Capacity, constant capacitating until we are okay but for now, I would say me as an individual I have a problem.

4.4.2.2 No clear policy at participants' disposal

The participants had a general understanding of inclusive education, but they had not seen specific documents with detailed information on inclusion. The participants were quite vocal about this absence of specific policy detail and information, and emphasised that the important pillars of policy implementation are communication, accessibility and attitude towards implementation. Policy needs to be communicated with all the stakeholders, who must be able to access the policy, and who must then be able to form a constructive attitude towards the policy.

Participant 2 stated: ―*The policies in our mainstream schools are not adequate to address all these challenges reason being that for me instance I have never seen a policy that I should do in terms of dealing with learners in the inclusive classroom. We need to have policy documents to guide us*‖. Participant 3 agreed, stating: ―*If already there is an inclusive, I will be happy to get a copy because it will guide me and will enable me take an active role as I am aware that I can turn the table around and make this a fully practiced policy. To me it is a policy in theory not in practice*‖.

Participant 7 provided a more detailed answer that focused on the need for a clear policy in order to ensure enforcement, by making the consequences for ignoring the policy clear:

Definitely mam, we need a policy and schools need to have a policy in place so that when teachers do not follow this kind of policy you can call sanctioning this kind and you can actually call the teacher into task, right now everyone does but when a schools labours or enforces some find law automatically teachers will follow suit and they won't have to break the law because we all IQMS is a score point and no one wants to receive low marks. So yes, when inclusive education is a policy and its

incentive driven you will find that everything will come into place and teachers will work in accordance to what is required from the child is slow to become better for the child that is gifted to get higher.

Lack of information tends to affect the proper execution of what needs to be done. According to Boston-Kemple (2012), lack of knowledge gives rise to confusion, disagreements and division. Teachers without the required information on the policy of inclusive education would not be able to implement the policy and see it achieve its intended purpose, as laid out in Education White Paper 6 (DoE, 2001).

4.4.2.3 Work readiness programmes through monitoring and coaching

Various studies have shown that undergraduate educator programmes in South Africa have not adequately prepared teachers to meet the needs of learners with diverse needs in their classroom (Mackey, 2012). Participant 2 emphasised this lack of training and preparation:

I don't if you are asking in terms of the training that we received during college or the training that we have as teachers, there is not much that we were trained on with regards to inclusive education. They just give us content knowledge and not much information that prepares for these types of situations in the classroom so it's a challenge for us teachers because even if we do attend workshops, we don't get much information. Even at college we did not get training in terms of inclusive education, but we highlight and talk about it in a nutshell.

Participant 2 also indicated that the training received at university was completely different from what happens in class:

We need to have training in the real classroom with learners because the practices we received we were only teaching other students, so we did not have a clue of what is going on in the classroom.

This lack of training and preparation is a critical barrier to effectively implementing the policy of inclusive education. Fredrick and Cline (2009) in Madihlaba (2013) emphasise the practical measures that need to be taken by educators to create inclusive classrooms, such as reconsidering and reconstructing curricula, and providing and allocating resources to improve equal opportunity learning. These measures cannot be taken without the required prior knowledge. Eloff, Engelbrecht, Pettipher and Swart (2002) state that practising teachers are the key to the successful implementation of an inclusive system, but that they need time, ongoing support and in-service training. Actual change requires a long term commitment to professional development.

A lack of knowledge affects the proper implementation of what is prescribed. Teachers need to embrace diversity and become better informed, as this contributes towards their learners' construction of knowledge. Teachers without the necessary knowledge of the concept of inclusive education compromise its intended benefits, laid out in *Education White Paper 6* (DoE, 2001).

4.4.3 Theme 2: Barriers experienced by teachers in the application of the inclusive education policy

Participant 2 focused on barriers to effective teaching and learning, and how these barriers affect the implementation of inclusive education:

> *My perception about inclusive education in the intermediate phase is that, there is not much that is being done we are still having problems with learners that have barriers. So, it makes us as teachers not able to do our job as much easier as we want it to be. So, inclusive education in my opinion in this phase is not as established as well as we would want it to be.*

Mahlo (2011) observes that educators who are not fully prepared to teach learners with learning difficulties find it difficult to do so. Visser (2002) defines a barrier to learning as anything that prevents a teacher from succeeding in education. Walton, Nel, Hugo and

Muller (2009) describe barriers to learning as educational difficulties which may arise from a number of sources and may be intrinsic or extrinsic to learners. According to constructivist theory, the construction of knowledge is an active process, not a passive (Major & Mangope, 2012). As shown by Walton et al. (2014), a teacher‘s willingness and preparedness to be an active participant is therefore important in implementing inclusive education. The theory places a responsibility on the teachers to become equipped and creative in order to create a learning environment that offers the maximum benefit to all learners. This is reinforced by Nel et al. (2013), who maintain that learners who experience barriers to learning do not have to earn their way into a classroom. They need to be treated as full members of the learning group, even if modifications, adaptations and extensive support are needed.

4.4.3.1 Language barrier

Owen-Smith (2010) states that most learners within the South African context face a language barrier in the classroom, and that this disadvantages the learner. The LoLT in the intermediate phase is often not the learner’s home language but their First Additional Language. When learners are not free to communicate in their home language their comprehension tends to be poor, their vocabulary is limited, there are frequent breakdowns in communication in the lessons, and the learners are ultimately excluded from effective engagement and learning. Their results therefore tend to be poor, and this underperformance undermines learner’s self-confidence. Educators should ideally be able to teach learners using multiple languages in order to promote equality, diversity and inclusion. Intermediate phase maths teachers therefore require training in understanding and communicating Grade 3 content areas and different mathematical concepts in the multiple languages spoken by the learners they have in their classrooms.

Language barrier was a common barrier highlighted by numerous respondents in this study, as indicated by various responses. Participant 8 outlined the practical difficulty experienced in communicating basic mathematical concepts in the learner’s home language:

It is difficult to teach these learners because most of them cannot read with understanding and their counting is poor. I was not really trained for this. I allow them to read numbers and write them in words. In term 1 week 1, I allow them to write those numbers in isiZulu and do patterns but most of them are unable to that. They need specialist.

Participant 1 emphasised the importance of being responsive to learner's diverse needs, but the practical difficulty of doing so when the LoLT in the intermediate phase has shifted away from the learner's home language to the First Additional Language, usually English. This poses significant issues for communicating the conceptual language of mathematics:

Well my perceptions of inclusive education in the intermediate phase are as follows 1 It is a must that intermediate phase should use inclusive education because learners who are in the intermediate phase ehh need special kind of attention and in our teaching programme we must include learners of different needs to ensure that all of them are taken care of in their personal capacity as learners, you find that in the intermediate phase you have got learners that are faced with a difficulty of trying to understand the particular lesson in English that has not been used throughout the teaching and learning of mathematics in other grades foundation phase. If you are inclusive enough that this one will seek to address these learners who are needy for attention you will then have to answer all the questions that the learners will have to face at that stage.

It is clear that the language barrier hampers the communication of important concepts in the intermediate phase mathematics classroom, and reduces inclusivity. Participant 4 also emphasised the problem of effective communication in the intermediate phase mathematics classroom:

I know that my learners are very diverse in terms of learning and background. I know there are learners who are slow, but I give them more work so that they are on par with other learners. These learners are struggling to complete those extra activities and attention span is limited. Communication is a huge problem because I end talking alone.

Participant 8 further reinforced this observation, and explained some of the measures taken to try to overcome the language barrier:

> *Sometimes I do have difficulties; I think the main barrier in teaching mathematics is language. So, to deal with that as I have alluded earlier on I give them more work and I do remedial activities after each and every task. I explain and use objects or resources to include all of them in a lesson. Visualization and movement to minimize barriers.*

The participant's concerns and responses in relation to language as a barrier to teaching and learning can be understood in terms of constructivist theory. Thorne (2013) explains that constructivism is based on the belief and evidence that learners actively construct knowledge in their attempts to make sense of their own world. Language plays a major role in the construction of such knowledge. The construction of knowledge is very much an active process, not a passive one (Major & Mangope, 2012). Mathematical learning based on a constructivist approach aims to instil knowledge that is not only kept in the minds of learners, but also actively shapes new knowledge. Mulaudzi (2016) indicates that language must be used to build a classroom environment in which learners and teachers respect one another. Martin, Mullis, Foy and Stanco (2012) indicate that learners in Japan have generally showed high achievement levels in mathematics because the LoLT in Japan is learners home language.

The solutions to this complex issue of language in the mathematics classroom generally require practical educational resources. A colourful, visual, verbally rich classroom goes a long way to reducing the language and conceptual barriers in an inclusive mathematics classroom, as it enables a process of code switching to create meaning. The participants indicated that the use of letter boards, sight words, pictures, and sentences, labels on items, theme tables and language games could assist in minimising the language and conceptual barriers in mathematics. Additional resources need to be made available to educators for them to supplement the existing learning resources with visual and interactive resources to bridge the language and conceptual barriers

The researcher has found vocabulary charts such as the one in Table 4.2 to be very user friendly in the mathematics classroom.

Table 4.2: Example of a vocabulary journal

Word	Meaning	Synonym	Picture	Sentence
Sum	Answer to an addition problem.	Total, answer or solution	9+4=13	The sum of nine and four is thirteen
Difference	The answer to subtraction problem.	Answer, solution or difference	13-4 = 9	The difference of thirteen and four is nine
Multiples	A number added to itself.	Skip counting or product	Multiples of 5 5, 10, 15, 20,	A product of nine and five is forty five

4.4.3.2 Application of a differentiated approach

―Inclusive‖ and ―differentiated‖ are related terms in teaching practice. However, ―differentiation‖ refers to education shaped differently for different learners (Bottge et al., 2017). Learners are faced with different problems that educators must take into consideration. If educators do not understand that they must adopt a differentiated approach, some learners will be excluded from participating in the teaching and learning process. But educators often struggle to apply a differentiated approach when planning for mixed-ability groups in class. Being unable to cater equally to all learners is a barrier that most teachers face, and educators' understanding of what these barriers are is of great importance in the implementation of an inclusive mathematics classroom. Once teachers understand what types of barriers exist within their classes, they can identify and provide the necessary support and interventions to ensure that successful learning takes place.

Participant 6 explained that lesson preparation is a challenge in an inclusive environment because a one-size-fits-all approach does not serve all learners. Lesson planning in an

inclusive environment involves being more creative to ensure that all learners are equally engaged and actually understand what is being taught. However, due to a lack of training and time constraints, such a differentiated approach is difficult to sustain:

> *So, when I plan its challenge for me and it is time consuming. I waste lot of time trying to cater for all the learners and the paper work is too much. I sometimes feel as if the learners are being neglected and the administration takes a front seat. Hence one must have activities for high flyers and the slow learners as well.*

Gould and Vaughn (2000) contend that lesson preparation is key to providing accessible education for all, and state that lessons should be planned to accommodate the full range of needs and abilities that learners bring to the class. Constructivist theory proposes that through interaction, experiences and knowledge, an inclusive environment is created. However, in the inclusive classroom, diverse needs and possible language barriers impede effective interaction, basic reading, problem solving, and knowledge transfer, unless the educator has mad special preparations to take learners diverse needs into account in the lesson planning.

Participant 3 indicated that although most barriers to teaching and learning are located in the classroom environment, some are extrinsic, such as educators' reluctance to attend Professional Learning Communities (PLC) within the school:

> *My colleagues often complained when we have to our subject meeting and commonly known before. The worse thing is our meetings are scheduled to take place after the golden hours. Some of my colleagues have their lame excuses and as a coordinator I find this situation very stressful. We cannot have the meetings in the morning due to staff briefings and reading period to try and minimize the language pandemic.*

Botha and Kourkoutas (2016) attest that inclusion is not a mechanism for simply relocating educationally disadvantaged youngsters from special schools to mainstream schools, but rather implies a whole-school approach to producing meaningful learning, one that requires negotiation. Therefore, pedagogy is an important dimension of inclusion (Liasidou, 2012).

Participant 3 implicitly understood that platforms such as PLCs enable educators to capacitate one another through team teaching, and the sharing of strategies to build a differentiated approach. In this way productive communities of practice can be formed.

4.4.3.3 Poor learner counting skills and conceptual difficulties

Most of the participants offered the observation that their learners are excluded from effective learning in the intermediate phase mathematics classroom because of a language barrier, and because they are unable to count and problem solve at the level expected of them during this phase. The participants' spoke of language barriers and the conceptual difficulties experienced by their learners as related issues, some relating them more explicitly than others.

Participant 2 identified reading with understanding in the LoLT, problem solving, and basic mathematical ability at the appropriate level as challenges to effective and inclusive teaching and learning in the intermediate phase maths classroom:

> *Teaching is challenging because most our learners cannot read with understanding and problem solving is an uphill battle. I use both languages, isiZulu and first additional language, when teaching especially term one since I am currently teaching Grade 4 and Grade 5. On top of that some cannot count in the multiples of three and four and teaching mathematics becomes a huge challenge.*

Participant 6 concurred, also identifying a language barrier and a conceptual barrier to effective and inclusive teaching and learning in the intermediate phase maths classroom:

> *Difficulties like, for example, understanding the instructions in English, other learners fail to understand the instruction for example in problem solving sums, you find that the child will end up doing the wrong thing not getting the right answer because they don't understand the operation to be used. What they need to understand is that there are four basic operations in mathematics when solving problem and they need to choose correctly, and they must know which operation one applies in order to get the right answer.*

Participant 8 made the connection between language barriers and conceptual barriers a little more explicit, illustrating how gaps in key vocabulary lead to gaps in conceptual understanding and applying concepts:

> *I have a difficult group this year, up to now most of them cannot solve mathematical problems on their own, they need illustration before deciding on operation to employ and finding key words is difficult to most of them. You give them a problem solving sum then read line by line while explaining to them. It is time consuming and curriculum coverage is difficult, but I try.*

Naude and Meier (2014) describe mathematics as the story of how we organize our everyday lives to make sense of what is going on around us. Mathematics in Grades 4 to 6, the intermediate phase, includes the basic operations covered in the foundation phase (Grades 1 to 3). The intermediate phase is a critically important phase in schooling, but in South Africa the majority of learners have to cope with their LoLT shifting from their home language to a First Additional Language. In addition, Bowie and Reed (2016) explain that in intermediate phase mathematics learners are also expected to move from proficiency in arithmetic, based on counting, to proficiency in using more sophisticated mathematical tools. So in the maths classroom, learners are faced with having to make a conceptual leap and a linguistic leap at the same time, and difficulties therefore arise in developing a conceptual vocabulary.

The mathematics classroom during the intermediate phase is therefore likely to contain a greater diversity of learner needs than the average classroom, as learners grapple with both linguistic and conceptual demands. As Motitswe and Mokhele (2013) state, educators need to make use of diversified instruction strategies to cater for this diversity of learner needs. As shown by Evers and Spencer (2011), using one teaching method of instruction would be problematic, as the diversity of learners needs would not be met, and the mathematics classroom would not be inclusive. As stated by Vygotsky, our learning processes can be traced to our interactions with others (Hoy, 2008). Therefore, as argued by Simons (1993), learners and teachers need to collaborate in a constructivist learning environment work to create meaning.

4.4.4 Theme 3: Teachers' prejudices and discrimination

The educator's role has become a challenging one in that they have to try many different strategies to deal with the numerous issues that they face. But due to their limited knowledge of inclusive education, their learners' right to education is often violated.
Walton et al. (2014) note that an educator's attitude is important in implementing successful inclusive education, as educators need to create a classroom environment in which learning is accessible to all learners (Bond & Chernoff, 2015).

Educators' experiences provide important insights that could assist in improving education. Allowing educators to voice their personal experiences on the issue of inclusive education policy implementation and their daily experiences was important in this study as it allowed for a survey of information that would not otherwise have been shared.

4.4.4.1 Implementation of inclusive education policy

When all is said and done, the main concern is quality education. But it is clear that educators encounter numerous challenges that they have difficulty in addressing. Polat (2011) points out that inclusion requires that diverse learners not only be physically present at the mainstream schools, but that the necessary values, attitudes, policies and practices are present to ensure that all learners are able to participate fully in class. However, the respondents in this study showed that they lack this type of full conceptual understanding of what inclusive education means and requires. The lack of conceptual understanding of inclusive education was also prevalent in the questionnaires that participants completed.

Participant 3 described the inclusive mathematics classroom in terms of negatives, such as ―problem‖, ―waste time‖ and ―challenge‖, and did not seem to be implementing creative teaching strategies, but rather resorted to repeating ―the same concept over and over‖:

> *Yah, in terms of time inclusion waste time because learners with barriers I have to repeat the same concept over and over maybe like three or more until they*

understand so it's become a problem to the high flyers who you just explain once and they know what to do they on task so it becomes a challenge for us as teachers.

A lack of appropriately diverse teaching strategies can be attributed to a number of causes. Participant 5 saw the lack of appropriate teaching strategies as primarily a policy and training issue, as because many teachers are not familiar with the specifics of the actual policy on inclusive education, they are unsure of what the goals are, what to focus on, and where or how to start:

The policies in the mainstream schools are not adequate to address all these challenges reason being that for me instance I have never seen a policy that states what I should do in terms of dealing with inclusive education, we know that it's somewhere there, and there is a policy about inclusivity and no training on that. Subject advisors should provide us with copies of the policy.

Participant 7 focused on educator training as the primary barrier to the effective implementation of inclusive education in the mathematics classroom:

Mina I am not trained to deal with barriers and I need guidance on this and I think retraining of teachers are needed but in the meantime, I will teach those that are willing to learn. This very draining I have developed stress and anxiety while trying to assist on something I was not trained for.

Participant 8 focused on the difficulty of following the required curriculum in an inclusive mathematics classroom in the intermediate phase, due to the diverse requirements of the learners, which distract the class from the ideal progression through the curriculum:

With the CAPS curriculum it's very frustrating mam because we find that the lessons are not structured coherently you jump from one lesson to another and things are broken down what you start in term one you got to leave it hanging and it comes back in term 3 to this learners it is something new and you have start all over again and it is difficult to follow the annual teaching plan.

However, Participant 4 offered a specific insight and teaching strategy that supported the basic approach advocated for inclusive education, in embracing differences amongst the learners and using them positively:

> *In the five-year experience that I have teaching mathematics I have since failed the idea of grouping my learners in their capacity because one would understand that if learners are grouped according to their capacity yes you must enough time to around the classroom due to their diverse backgrounds. Mixing them will be much easier because they will also assist each other. Grouping them according to their abilities will create difficulties in enhancing inclusive education.*

4.4.4.2 Difficulty teaching mathematics

The participants were asked, ―What difficulties have you experienced in terms of enhancing inclusive education since you started teaching mathematics?‖ Participant 3 focused on how significant gaps in some learners' conceptual knowledge means that educators have to deviate from the curriculum to back track and spend time getting those learners to the level they need to be at.

> *Hmm what a difficult question, I think for me teaching mathematics is a major problem where you get learners which are not in the same level of development which means I must then implement inclusive learning instead of starting introducing 3 digit number I start with single number or 2 digits because majority of read three hundred and forty two as thirty-four two. Due to this I use lot of books including Jikimfundo although we have not started the programme yet.*

Participant 4 focused on a lack of support from subject advisors, but specifically in relation to differentiating the curriculum content to accommodate all learners:

> *Wow, that is a good question, and I think we need support from our subject advisors through content workshops dealing with curriculum matters, inclusive education*

and curriculum differentiation because for we only attend curriculum workshops only.

De Boer et al. (2011) assert that globally and nationally, departments of education have implemented inclusive education in schools as one of the policies to ensure quality education for all. However, the success of the implementation has been completely dependent on the teacher. Weeks and Erradu (2013) identify an oversight in White Paper 6, relating to the absence of support given to educators in order to teach a diverse range of learners simultaneously to their full potential. In relation to mathematics in particular, Purcaru and Unianu (2015) indicate that teaching mathematics requires competent planning and development of class activities.

Mpya (2007) draws a direct link between teaching strategies and learners' potential, concluding that good teaching pedagogies assist in unfolding potential in the learner. In line with curriculum differentiation and accessibility, the DoE has stipulated that teachers must make use of effective teaching strategies (DoE, 2005). UNESCO (2004) advocates multilevel teaching in inclusive mathematics classrooms. The use of multiple styles of transferring knowledge in classrooms is considered to benefit the educational experience of all learners. Teachers are considered to be effective if they link learning to the learners' backgrounds, with the use of appropriate teaching styles (Singh & Rana, 2004).

A flexible teaching strategy is one that allows for accessibility of the curriculum (Evers & Spencer, 2011). Flexibility, in respect to teaching style, leaves room for teachers to be creative as far as possible, to ensure that maximum learning occurs. Adapting one's teaching style to the context and environment is key to ensuring the productive construction of knowledge. The teaching style used must create an environment that encourages learning. The constructivist perspective argues that learners learn from their experiences. It is imperative, therefore, that teachers create an environment that stimulates learners' knowledge and leads to an understanding of their experiences.

4.4.4.3 Few learners can learn mathematics

Mathematics anxiety is defined as feelings of tension and anxiety that interfere with handling numbers and solving mathematical problems in a range of ordinary life and academic situations (Haciomeroglu, 2017). One of the many prevalent mathematics myths is that some people have a ―maths mind‖ and some don‘t. Participant 8 identified some of this mathematics anxiety in the classroom:

> *Due to a number of barriers have most of are not keen to do calculations and they just write any number and in school-based assessment they are trying because I explained or give them similar exercises that they have done in class. When writing common papers failure rate is very high because that have to do assessment on their and now is explaining so few learners passed.*

Teachers should try to create a classroom environment in which learning is accessible to all learners (Bond & Chernoff, 2015). Mathematics classroom need to be more visually engaging in order to stimulate learners' interest and confidence. According to constructivist learning theory, the learners' context contributes towards learning and development, as during interaction and sharing in the social context, basic concepts are integrated into relational concepts (Pillay, 2004).

4.4.4.4 Resources are a challenge when teaching mathematics

The participants indicated that they have to bring their own teaching resources, and are not supported in the provision of resources for mathematics. Participants 7 and 8 related examples of basic but necessary resources that they have to provide at their own expense if they are to achieve some basic learning outcomes:

> Participant 7: *I bring a bathroom scale to school for learners to weigh themselves so that we can collect the data by comparing their mass in the morning the mass after have food during the first break and we able to that for three days only and after that the scale was stolen and the school was unable reimbursed me.*

> Participant 8: *Drawing the face of the clock or using the toy clock was not helping at all so I decided to buy a clock for my class. I only used that clock for about two weeks and after the long weekend the clock disappeared. My class is used by the community members every Sunday for church gatherings.*

Other participants focused on the absence of textbooks, and how the organisational and financial responsibility for providing basic resources that the DoE should provide now falls on them if their learners are to make any progress:

> Participant 2: *My sister always assist me she bought a photo coping at an auction sale so I make my copies at home and I have taken money from savings to buy ink and master and its difficult but I have to if I need good results.*

> Participant 4: *Mina I make copies out of own pocket and causes a lot of stress because I get nothing from the school. I provide glue for my learners because most they don't buy stationery and they only rely on what they get from the school beginning of the year and after yooh it's difficult*.

Participant 5 focused on the misallocation of scarce resources to non-essential events, such as parties, when basic resources for teaching are not available, and criticised the school management directly for this poor decision making:

It is hard to be a mathematics teacher due lack of support from the School Management Team (SMT) and the School Governing Body (SGB). They refuse to buy resources using the fundraising money or money that is allocated for Norms and Standards. Money is used for other unimportant things like funding Grade 7 farewells and what about us.

4.4.5 Theme 4: Effects of large class sizes in an inclusive environment

4.4.5.1 Lack of space and lack of resources

Participants 5 and 6 focused on the issue of large class sizes, overcrowding in classrooms, and an unworkable educator-learner ratio, which effectively comes back to a lack of provision of adequate general resources for basic education.

> Participant 5: *Yes we do have such challenges because our schools especially the African schools we have a problem of the enrolment, we have a large number of learners in the same class whereas it is difficult to do group work or to group learners according to their abilities and also the floor space is a big challenge whereas you have to interact with every learner in the class, you to make sure that learners are fully engaged in lesson. Even if the groups are formed due to space, I cannot move freely to assist each and every group and also have one on one. The insufficient also may hinder the implementation of the inclusive education because sometimes we need resources like trundle wheel, bathroom scale and other important resources but we improvise*.

> Participant 6: *Yes there are some difficulties because for example in our schools there is a problem of space and overcrowding of the learners and it becomes very difficult to group them in groups because the teacher ratio is not properly exercised so it becomes difficult to do the individual special attention to each learner and they need it since other are slow others are highly gifted and others are of average The teacher ration should be one teacher is to 35 in fact We have got 1 is to 70. That is the main difficult thing.*

Participant 8 mentioned how the overcrowded classrooms contain old and damaged desks that rip clothing if people are not careful. What may seem like a minor issue is in fact a major disincentive for the educators in these classrooms to move around and help learners or groups of learners individually:

Last week I was supposed to mend my third trouser and I am tired because the school is quiet about this nightmare and I am no longer keen to move around providing assistance to all the learners with challenges to learning.

When a class holds more learners than the number recommended for the available resources and educators, this is referred to as overcrowding (Mushtaq & Khan, 2012). It is a well understood fact that such overcrowding poses many practical challenges to teaching and learning. Legotlo (2014) describes how slow learners are not given the necessary attention, and how general feedback for all learners is not possible. Overcrowding is therefore clearly an obstacle to the successful implementation of inclusive education
(Ladbrook, 2009). The educators in this study had first-hand experience of teaching in overcrowded classes, and in being made responsible for developing creative strategies without any practical support.

4.4.5.2 Differentiated teaching is a challenge

Participant 7 described the efforts that are necessary to ensure that learners of all levels and abilities are catered for in her intermediate phase maths classroom:

First and foremost as the form teacher of the class and teaching a form subject like mathematics you got to know the needs and the abilities of the learners and you know that certain learners have strength and weaknesses and once you do that analyses of your learners you know which level to pitch in that class and when you have certain aspects of the CAPS curriculum you have to actually isolate the learners that are battling and teach concepts over and over so that you labour that concept so that it's driven home that later that child does not have difficulties but for the learners that are high flying or those that cope very well I also create a room for improvement where I throw in some very difficult task to get them occupied and to get their minds working so I prepare my lessons catering for all needs of learners but in between my lessons usually a pack of cards I shuffle it up and work from one group to another although we don't have grouping but I have my own groupings

where I deal with different learners at different parts of the lesson so that at the end of the lesson when you tie it up it's one neat present with a bow at the top.

However, other participants described how difficult it is for them to attend to the diverse needs of the learners while still sticking to the CAPS syllabus content. Responding to learners' needs often requires the educators to spend extra hours assisting them in the mornings and afternoons. Participant 2 stated: ―*If I don't avail myself no one is going to assist them, and their performance will be affected*‖. Participant 1 explained the necessity of the extra hours: ―*I manage to complete the CAPS syllabus since it very long and all the content areas must be covered to minimize gaps our learners might experience on their journey to senior phase*‖. Participant 4 stated that, despite the extra hours, ―*I always try to move with all my learners and that delays and I find myself battling to cope and also have a struggle when comes to curriculum coverage*‖.

Inclusion mathematics education requires the educator to alter the learning plan according to each individual learner, in order to maximise the likelihood that all learners will be able to participate in the classroom activities and experience effective learning (Sharma & Nuttal, 2016). However, in overcrowded classrooms, as observed by Konza (2008), lack of resources and a negative attitude towards the large class on the part of the educator can result in a lack of individual attention, which can put those learners that require special attention at a disadvantage. If learners with barriers to learning are not well supported or accommodated within the classroom, then their learning becomes extremely difficult, they can start feeling neglected and helpless, and they can ultimately decide to leave the school system completely and discontinue their education (UNESCO, 2004). Constructivist theory underlines the fact that knowledge is not a commodity to be transferred to learner, but is rather a construct that is assembled through an active process of involvement and interaction with the environment.

4.4.5.3 Excessive marking and delayed feedback to learners

Written feedback is a crucial communication tool in overcrowded classes, since regular one-on-one communication is practically impossible due large class sizes. The participants described how they are inundated with heavy marking loads and administration, which leaves very little extra time for personal feedback. However, as shown in the previous section, for differentiated teaching to take place, additional time outside of class time is needed to assist the learners who are having difficulties. The volume of marking and written feedback in relation to overcrowded classes was identified as a problem by. It was also evident in the questionnares. Participant 4 and Participant 7:

> Participant 4: *I always take exercise book with me when I go home because I don't manage to mark all the books during my free periods and I am always tired and I start my day at 4 in the morning to prepare and complete my marking*.

> Participant 7: *I think the system is mathematics should be given more time, mathematics must have teacher aid in assisting with the marking class work and home. In that case I don't have to work home since I relay on public transport. Teachers must be provided with computers and overhead projectors to minimize time of writing on the chalk board*.

Focused and creative lesson planning therefore becomes even more necessary to ensure that enough time is spent on tasks and that an environment is created within the classroom that stimulates the teaching and learning process for all and promotes inclusive education. Planning is therefore the foundation to the creation of an inclusive environment, and an educator‘s success depends on it. This is supported by Eves and Spencer (2011), who finds that the design and planning of lessons must seek to accommodate and all learners in a classroom, making learning accessible to all.

4.4.5.4 Discipline in large classes

Educators in South Africa are not trained in alternatives to corporal punishment, so their own creativity plays a major role in putting systems in place to instil discipline in the classroom. This becomes even more of a challenge in overcrowded classes. The participants described how frequently revisiting and re-establishing shared classroom norms, issuing clear and direct instructions, and enlisting the assistance of group leaders were methods they used to create a disciplined environment.

Participant 5 stated: ―*In my class my learners read the classroom norms before we start the lesson and that alone attempt to eliminate ill-discipline in my class. So, we manage time to do our class activities within the prescribed time*‖. Participant 6 indicated that each group is led by a group leader who makes sure that the learners are focused, prepared and engaged before the educator arrives: ―*When I go to class, I find each and every group fully engaged doing their workbooks and their work is neat because group leaders encourage and assist in producing neat and legible handwriting*‖.

In a constructivist learning environment, group engagement is considered critical for building shared understanding in an environment where learners and educators respect each other (Mulaudzi, 2016). Educators who allow learners to be involved in the planning and execution of their lessons, allow the learners to become initiators of their own learning, which strengthens focus and engagement and minimises disruptions (Naude & Meier, 2014). Stiff (2001) describes how learners construct their knowledge best when it is socially rooted in their social contexts, while allowing for diverse forms of interaction. Anderson (2016) provides a synthesis of all forms of constructivist theories, stating that they share the understanding that the individual‘s construction of knowledge is dependent upon individual and collective understandings, backgrounds and proclivities.

4.4.6 Theme 5: Lack of parental involvement in the inclusive classroom and community

Parental involvement is facilitated by legislation in South Africa, and is supported by the South African Schools Act of 1996, which states that principals should allow parents the right to have a voice in the education of their children. The role of parents is very important in inclusive education. However, the participants in this study described how poor parental involvement has a negative impact on educational outcomes in general, and on the success of inclusive education in particular.

4.4.6.1 Supervision of homework is an uphill battle

Homework is an important component of mathematics teaching because the skills and logic are intended to be applied and practised in all areas of life. Homework can be part of school-based assessments in the form of projects, assignments or investigations.

Participant 2 described the frustration experienced due to non-completion of homework assignments:

> *I was teaching in a high school before and I took a transfer because I was far from my family. In my new school I was allocated grade 4 and 5. I gave them an assignment on Monday due on Wednesday. When I collected the assignment on the due date, I only received about forty assignments out of 84 learners in grade 4 and 5. So I went back and make copies and I decided to keep them during break and after school.*

Most of the respondents indicated that in their school they have time in the afternoon or morning set aside for assignments and homework, but it is very draining because it takes up teaching time and creates an added responsibility that should not be theirs. Participant 4 described how setting aside such time for homework during the school day solved the issue of non-completion of homework assignments. This solution, however, removed the away

from-school homework component completely, making it an added responsibility for the educator to oversee:

> *In our school we decided on the PLC meeting that Grade 4 and 5 do their assignment in class in groups under the supervision my supervision since I am teaching Grade 4. The morning classes are huge success thanks to Grade 3 educators who also do their homework in the morning by the time they in the intermediate phase they are immune to this arrangement.*

However, Participant 7 placed the responsibility on the learners to do their projects and assignments:

> *Mina I issue out assignment to all the learners and I always monitor their progress until the due that than I collect all the assignments assisted by the group leaders thus far I am okay because they all submit, and their parents call me if they encounter problems in an assignment or investigation.*

Participant 2 related how these added time pressures and responsibilities, which educators are not paid for, have a detrimental effect on their daily lives:

> *Last month I received a fine because my disk expired and that was totally out my mind because of the morning class and afternoon study. My starts at half three in the morning marking and prepare for the lesson for each day. I suffer because our parents are not responsible at all and the school is not going to reimburse me for that.*

Capacitating parents to take an active role is a necessity. It will minimize challenges in the provision of quality education, decrease drop-out rates, and encourage assistance in raising funds for resources and looking after the school to prevent vandalism. In addition, given the time and resource constraints mentioned by the participants so far, adequate parental involvement is the only hope for ensuring that time and resources at school can be spent on ensuring that classrooms are inclusive and that effective learning is experienced by all, particularly in the mathematics classroom, where additional teaching efforts are required.

4.4.6.2 Attendance at curriculum meetings

The issue of parent attendance at curriculum meetings varied according to the institution that the participants came from. Participant 1 stated: ―*In my case attendance is not poor because our parents find an opportunity to meet and discuss their learners' progress, so it is the opportunity they don't want to miss*‖. However, Participant 5 had a more negative view: ―*In our school attendance is normally poor and parents mostly come to argue with the teachers clearly stating that teaching learning is the school business, so they are not involved at all. So, we have a challenge in this regard*‖.

4.4.6.3 Parent-teacher interviews

Parents are often called for interviews, but only a few honour the appointments. Those who do often arrive early or late. Those who don't come at all seldom provide excuses.
Participant 1 lamented:

> *I always wait for the parents to honour the appointment. The parent either comes early while I am in class teaching or while I am busy with my marking. Sometimes I stayed behind with the security guard waiting for the parent and the parent did not show up.*

4.4.6.4 Parents misunderstand their role or are indifferent to it

Participant 4 described how parents in the school community are not supportive all, and are quick to judge the school and the teachers:

> *Parents have the mentality that assisting their children at home or supervising home lies in the hands of the educator and forgetting that we are partners in education of our learners. They used to say teachers must do their job that they are paid for.*

Participant 3 and Participant 5 illustrated how parents do not equip their children with the most basic requirements, such as stationery. Participant 3 stated that ―*teaching in a public school is stressful and very challenging. Unlike the past we are facing a number of problems and my learners come to school without the basic stationery and completing daily tasks is a problem*‖.

Participant 5 added the following:

> *In our school we issue out the stationery packs beginning of the year and after that the school fundraise to buy more in order to replenish the stationery. Our parents don't care at all but emphasis on quality and minimum requirements on written activities is very important.*

The involvement of parents plays a major role in education. Their role is to support teachers, and to run the school through their involvement in the democratically elected school governing body (SGB). Section 20 requires the SGB to embrace a constitution, develop a vision and mission statement, develop a code of conduct for learners and support staff in the performance of their professional functions, determine times of the school day, run and control school property; inspire volunteers to assist the school, make recommendations about staff appointments, and allow the reasonable use of school facilities for other learning programmes.

Participant 5 explains that parents need to undergo a process of capacity-building in order to understand their role in their children's education.

> *The department has to deal with the policy and train parents because thus far they are excluded. I would love to see parents being capacitated and inclusive forms agenda items during curriculum workshops. Homework timetables with homework policy pasted in learner's homework books. Parents can also assist in homework centres initiated by the School Governing Body.*

4.5 CONCLUSION

This chapter presented and analysed the data that was collected from the interviews and questionnaires. The data generated provided a deeper understanding of the experiences of educators who are teaching mathematics in the intermediate phase, and who are expected to ensure that an inclusive approach to education is being practised. The educators' experiences were interpreted using thematic analysis, and five main themes emerged. The findings were analysed through the lens of Vygotsky's constructivist theory.

The results indicated that these teachers in the intermediate phase mathematics classroom understood the basic conceptual meaning of inclusive education practices, but were not familiar with the details of the policy, or how it is expected to be implemented. Nevertheless, these educators tend to employ multiple strategies of their own to try to ensure inclusion in the intermediate phase. The conditions in which they try to implement inclusive education are difficult, as they are under-resourced (in terms of training, time, space and educational support materials) and under supported (by school management, by parents, and by the DoE), thus hampering the full implementation of inclusive education. The results indicated that educators teaching mathematics in the intermediate phase still need proper training and support. The following chapter presents a discussion of the findings, recommendations and limitations of this study, and provides an overall conclusion.

CHAPTER 5

DISCUSSION, RECOMMENDATIONS AND CONCLUSIONS

5.1 INTRODUCTION

This chapter presents a summary of the research process, and a summary of the findings on the inclusive practices in the intermediate phase mathematics classroom, in accordance with the main themes that emerged from this study. A summary of the overall recommendations for the education community is then presented. Recommendations for further research are discussed, after which the limitations of this study are addressed, and a final overall conclusion is presented.

5.2 SUMMARY OF THE RESEARCH PROCESS

5.2.1 Aims, objectives and research questions

The primary aim of this study was to qualitatively assess inclusive education practices in the intermediate phase mathematics classroom. The primary objectives of the study were therefore as follows:

- To evaluate the educators ‘perceptions and practices of inclusive education in the intermediate phase mathematics classroom.
- To understand strategies that can be employed to enhance and promote inclusive education practices in the intermediate phase mathematics classroom.
- To provide recommendations on how inclusive education practices can be improved in the intermediate phase mathematics classroom.

Accordingly, the following research questions guided the study:

- What are educators‘ perceptions of inclusive education and what are their practices in the intermediate phase mathematics classroom?

- How can educators in the intermediate phase mathematics classroom enhance inclusivity?
- How does inclusive education need to be improved in the intermediate phase mathematics classroom?

5.2.2 Research paradigm and design

The aim of this study was to explore inclusive education practices in the intermediate phase mathematics classroom from the perspective of the educators. An interpretivist research philosophy was therefore used to investigate these perspectives, grounded in a social constructivist world view underpinned by the work of Vygotsky. A qualitative research approach was used to construct the investigative interpretivist framework. The researcher selected a case study research strategy, and used purposive sampling to select participants who were experienced educators with the relevant background in mathematics teaching in the intermediate phase. The study was conducted at three primary schools located in KwaMakhutha, an urban area under Umbumbulu tribal authority in KwaZulu-Natal, South Africa.

5.2.3 Data generation and data analysis

The researcher used two instruments to collect qualitative data from the participants: a structured, face-to-face interview and a questionnaire. At all times the correct ethical procedures for gathering the data were followed, as discussed in section 3.8. The interviews were audio recorded with the permission of the participants, and their responses were carefully transcribed. The interview and questionnaire responses were subjected to thematic analysis, based on Braun and Clarke‘s (2006) six-step method. The results of this analysis are summarised in the following sections.

5.3 SUMMARY OF INCLUSIVE PRACTICES IN THE INTERMEDIATE PHASE MATHEMATICS CLASSROOM

5.3.1 Theme 1: Lack of training and skills development

The policy of inclusive education has put educators under pressure, as they have been made solely responsible for its implementation and success (Ntombela, 2011). Ntombela (2011) observes that educators are now referred to as ―change agents‖ within the inclusive education policy framework. It is therefore vital that educators have an adequate understanding and knowledge of inclusive education for the policy to be successfully implemented (Lalvani, 2014). However, while the findings indicated that all participants in this study had a basic understanding of the concept of inclusive education not have adequate knowledge of specific practices that could be used to implement successful inclusive education in the intermediate phase mathematics classroom.

The participants' existing knowledge as educators was based on the training they had received at tertiary level and on various capacity-building workshops that they had attended during their career. However, none of these sources of knowledge had directly addressed questions of inclusivity or how to create an inclusive mathematics classroom. As well as. The consequences for the participants of being under-equipped to create and manage the demands of an inclusive mathematics classroom included a sense of confusion, overwhelm and overwork, fatigue, and a generally negative attitude towards the additional demands placed on them. It is therefore essential that capacity-building for educators be expanded significantly to include programmes specifically related to creating and managing an inclusive classroom, in order for the educators to access and develop the knowledge, skills, attitudes and values necessary for them to fulfil their roles.

Botha and Kourkoutas (2016) argue that inclusion requires a whole-school approach, and Monsen et al. (2014) point out how the success or failure of implementing inclusive education policy should not be solely dependent on the classroom educator. It is clear that at the very minimum, educators should be supported by the broader educational structures with practical and relevant skills training and development.

5.3.2 Theme 2: Barriers experienced by teachers in the application of the inclusive education policy

There are some specific challenges and barriers that educators face in their efforts to apply inclusive education principles in the intermediate phase mathematics classroom. As shown by Walton et al. (2009), these barriers to learning may arise from a number of sources and may be intrinsic or extrinsic to learners. The participants in this study identified three barriers in particular:

- A language barrier
- Difficulty in the application of a differentiated approach
  - Poor learner counting skills and conceptual difficulties.

Education White Paper 6 (DoE, 2011) states that the norms and standards for educator training must be revised to ensure that educators have the skills to identify and address barriers to learning, and are able to accommodate diverse learning needs. This needs to take place as a matter of urgency.

5.3.2.1 The language barrier

As shown by the majority of the respondents, the language barrier that emerges in the intermediate phase mathematics classroom poses a serious challenge to teaching and learning. Due to a limited proficiency in the LoLT, a breakdown in communication occurs between educators and learners, and between learners and the more difficult conceptual subject matter that is dealt with in mathematics in the intermediate phase.

The participants related their attempts to bridge the linguistic/conceptual divide by using simple English when communicating with their learners, answering in full sentences, recapping the previous day‘s work, and relating concepts to their learners‘ context, all in a way that is able to accommodate all the learners. However, the solutions to this complex issue generally require practical educational resources. A colourful, visual, verbally rich classroom goes a long way to reducing the language and conceptual barriers in an inclusive

mathematics classroom. The participants indicated that the use of letter boards, sight words, pictures, and sentences, labels on items, theme tables and language games could assist in minimising the language and conceptual barriers in mathematics. Additional resources need to be made available to educators for them to supplement the existing learning resources with visual and interactive resources to bridge the language and conceptual barriers.

5.3.2.2 Application of a differentiated approach

Lesson planning and delivery is a challenge to most educators at the best of times. But this becomes even more of a challenge when complex mathematical teaching has to be tailored to all of the learners, regardless of their needs, all of the time, with no additional practical knowledge, resources, or support. The pressure starts to really pile on when the research suggests that preparation of mathematical lessons hold a key in providing accessible education to all learners, and that all lessons should be planned to accommodate a range of needs and abilities that learners bring to class (Gould & Vaughn, 2000).

A differentiated approach on the part of educators towards the curriculum, and to the presentation of knowledge, is critical. Researchers such as Motitswe and Mokhele (2013) foreground the fact that all learners are unique, and so is their way of learning. They recommend that educators plan and adjust their lessons extremely carefully, creatively and efficiently to accommodate learners with diverse backgrounds. Bottge et al. (2018) describe such a differentiated approach as ―education shaped differently for different learners‖.

Most of the participants in this study tried to apply this differentiated approach in their classrooms, but they indicated that they need training and workshops on best practice, and on practical strategies that are efficient and productive. They also indicated that they needed additional resources to present content in a way that caters for multiple learning styles and to provide learners with multiple paths to knowledge and multiple ways to engage with content according to their personal needs. Many of the educators described how they were expending a great deal of additional time, energy and personal resources to ensure that all

learners were catered for and that the curriculum was adhered to, and they indicated that this was an unsustainable way of working.

Learners with diverse mathematical backgrounds can only be accommodated when educators teaching mathematics are eager to change their teaching methods. It is therefore essential that educators are trained in how to adopt a differentiated approach to lesson planning and delivery in a way that is sustainable for them. They also need to be provided with the resources to communicate concepts and content in multiple ways that cater for diverse educational needs and learning styles.

5.3.2.3 Poor learner counting skills and conceptual difficulties

Basic mathematical skills from the foundation phase, such as counting, and more advanced conceptual skills, such as problem-solving skills, are a challenge in the intermediate phase mathematics classroom. Participants indicated that the LoLT of the intermediate phase and the language used in mathematics textbooks (usually the learner's First Additional Language and not their home language) poses a serious challenge to the learners' ability to ―catch up‖ on basic foundation-phase skills and to understand the more advanced intermediate-phase conceptual skills. The participants indicated that it is best to use examples from the learners' familiar context. They also showed that much greater attention needs to be paid to how learning mathematics in their FAL compounds conceptual difficulties that learners may already be experiencing. Mathematics anxiety, and the generally low achievement levels in mathematics, needs to be understood as also a language issue, and the link between language difficulties and conceptual difficulties needs to be acknowledged and addressed in the intermediate phase mathematics classroom for the teaching and learning environment to become successfully inclusive.

5.3.3 Theme 3: Teachers' prejudices and discrimination

Most of the participants in this study showed some degree of prejudice against inclusive education, largely due to the pressure and responsibility placed on them to implement it

successfully, and the absence of any practical support or guidance. They explained the need for practical curriculum and lesson-planning support from subject advisors, and for ongoing professional development within a professional community. They also explained the need for basic teaching necessities such as textbooks, and items to demonstrate mathematical concepts, such as scales, clocks, etc. The participants explained that the organisational and financial responsibility for providing their learners with basic resources that the DoE should provide now falls on them if their learners are to make any progress. In this already difficult context, having to include a very diverse range of learners in addition to the existing difficulties feels like an unwelcome added burden. The DoE needs to free educators to teach in a positive, creative and differentiated way by providing them with the necessary skills, textbooks, and classroom items to implement inclusive education successfully in the intermediate phase mathematics classroom.

5.3.4 Theme 4: Effects of large class sizes in an inclusive environment

In addition to the practical pressures on the participants already discussed, they described how they had to deal with overcrowded classrooms, where the teacher-learner ratio is often twice what it should be. Overcrowded classrooms are extremely detrimental to successful teaching and learning. The sheer number of learners and lack of space tends to foster disruptive behaviours, and precious time is wasted trying to instil focus and discipline. Tasks take longer than they should, making it more difficult to stick to the recommended curriculum, and leaving very little time for educators to address the diverse needs of all learners. Loss of teaching time due to disruptions in class was one of the factors that affected effective curriculum coverage the most, and required the participants to use extra time for remediation In addition, large classes mean a lot of marking and assessment, and very little time for individual feedback.

Participants addressed the challenges of overcrowded classrooms by simply trying their best to reach all students. Some participants tried to involve the learners more actively in their learning by giving those added roles and responsibilities in the classroom, making them

responsible for their own discipline, thus minimising disruptions to teaching and learning. They attempted strategies such as rearranging learners' seating, rotating leadership roles, and frequently re-establishing classroom norms with the learners. They also protected teaching time by insisting that learners arrive on time for class. Such approaches are supported by constructivist theory, which advocates that learners be involved in constructing their own knowledge and be free to use their own strategies to learn.

All the above solutions, however, deal with the symptoms of the problem and not the cause. Successful inclusive education in the mathematics classroom, particularly in the intermediate phase, is simply not possible when classes are overcrowded. Mathematics class sizes need to be reduced, particularly from the intermediate phase onwards, to avoid compounding the language barriers and conceptual difficulties with the stresses and demands of overcrowded classrooms.

5.3.5 Theme 5: Lack of parental involvement in the inclusive classroom and community

When parents do not participate in their children‘s education, it becomes a barrier to learning (Ntombela, 2011). All the participants stated that parental involvement in the education of their children is one of the key factors in implementing inclusive education successfully. However, they related that parental involvement is minimal. Parents do not supervise or take an interest in homework and assignments, and do not ensure that learners complete homework tasks. Parents do not attend curriculum meetings, and often do not respond to requests for parent-teacher meetings. They also misunderstand their role as parents, and the educator‘s role as teacher, and place all the responsibility for their children‘s education on the educators.

Most of the participants indicated that parents need to be encouraged and capacitated to take an active role in their children‘s education. Parents are not aware that they are important partners in their children‘s education, and that their role and the educator‘s role are complementary.

Successful inclusive education depends on parent participation (Mpya, 2007). Parents need to play a full part in the education of their children, as educators already have to deal with a host of extra responsibilities. They cannot also be expected to provide the only support structure that each learner has. Most participants indicated that they are on treatment for anxiety and stress. Nevertheless, they all go the extra mile to assist learners, in spite of their already overwhelming responsibilities and workloads, and burn the candle at both ends to prepare lessons, complete marking, and assist and guide learners.

5.4 SUMMARY OF RECOMMENDATIONS FOR THE EDUCATION COMMUNITY

The recommendations for the education community that this study has produced fall into five main areas:

1. Educator training and development in inclusive education practices
2. Provision of basic resources for education, and additional resources for inclusive education, particularly in the mathematics classroom
3. Recognition of the problem of overcrowding, and the reduction of class sizes, particularly in the mathematics classroom
4. Full recognition of the link between language barriers and conceptual deficits in the mathematics classroom
5. Support from parents and the wider educational community.

The recommendations are summed up in Table 5.1.

Table 5.1: Recommendations for the successful implementation of inclusive education in the intermediate phase mathematics classroom

RECOMMENDATIONS	
Appropriate educator	An audit into educators' skills is necessary to determine the training that must take place for the successful implementation of inclusive education.

training at tertiary level	Norms and standards for educator training must be revised. From the start, educators must have the skills to identify and address barriers to learning, and accommodate diverse learning needs.
	It is particularly important that educators be trained in differentiated approaches to lesson planning and delivery that are sustainable for them.
Ongoing professional development	Existing educators must be given specific training in how to create and manage an inclusive classroom, in order for them to develop the knowledge, skills, attitudes and values necessary to fulfil their roles.
Provision of basic teaching resources	An audit of the available resources in schools must be conducted to determine areas of lack. Resources play a crucial role in the successful implementation of inclusive education in the classroom.
	The DoE must provide textbooks and resources to implement inclusive education successfully in the intermediate phase mathematics classroom.
	Mathematics educators in particular need to be provided with the resources to communicate concepts and content in multiple ways to cater for diverse educational needs and learning styles.
Reduce class sizes	Successful inclusive education in the mathematics classroom, particularly in the intermediate phase, is impossible when classes are overcrowded. Class sizes must be reduced so that the stress of overcrowded classes does not compound language barriers and conceptual difficulties.
Recognition of language barriers, and provision of additional resources	Mathematics anxiety, and the low achievement levels in mathematics, needs to be understood as also a language issue. The link between language difficulties and conceptual difficulties must be acknowledged and addressed in the intermediate phase mathematics classroom for the teaching and learning environment to become successfully inclusive.
	Additional resources need to be made available to mathematics educators for them to supplement the existing learning resources with visual and interactive resources to bridge the language and conceptual barriers.
Support from parents	Parents need to be encouraged and capacitated to play an active and responsible role in their children‘s education.

5.5 RECOMMENDATIONS FOR FURTHER RESEARCH

Further research needs to be conducted on the experiences of educators in the implementation of inclusive education, both in South Africa and abroad. In particular,

further research needs to be conducted on inclusive education in the context of the mathematics classroom, and specific attention needs to be paid to the critical intermediate phase. It is also necessary to investigate learners' and parents' experiences of inclusive education practices in mathematics in the intermediate phase. All of these suggested paths for future research could also be applied to the foundation and senior phases.

This study investigated the experiences of teachers at three educational institutions in the Umlazi district. Educators' experiences at other local schools in KZN and South Africa also need to be investigated. The sample size was limited to eight participants, and there is a therefore a pressing need for a study with a larger sample size. A larger sample size, and a broader research setting would generate data that would be easier to generalise.

5.6 LIMITATIONS OF THE STUDY

This study was limited to a small sample of educators (eight participants), at three primary schools in Umlazi District, KwaZulu-Natal, South Africa. The sample was restricted to only intermediate phase educators who teach mathematics within Mafa cluster of Umbumbulu circuit. The findings cannot therefore be generalised, as they apply to a limited sample group and a very specific social, political, economic and cultural context.

5.7 CONCLUSION OF THE STUDY

The aim of this study was to qualitatively assess inclusive education practices in the intermediate phase mathematics classroom. The findings of this study highlighted the need for appropriate educator training at tertiary level; the ongoing professional development of the existing educators; the provision of basic teaching resources, and specific teaching resources for mathematics; the recognition of overcrowding, and a reduction of class sizes; the recognition that language barriers contribute enormously to conceptual gaps in mathematics, and provision of additional resources; and the need for parents to play an active and responsible role in their children's education.

Each and every part of the education system has to responsibly fulfil its role in order to improve the education system of the country. Only in this way can educators be fully empowered to implement inclusive education in mathematics, as the participants in this study showed clearly that without the necessary support they find themselves overwhelmed and overburdened, and are unable to carry out their roles and responsibilities successfully.

When educators are well supported through appropriate skills training and professional development, and are provided with the necessary basic resources for effective teaching, their attitude improves, their efficiency and effectiveness improves, and the overall quality of teaching and learning in the classroom improves, having a beneficial effect on learners' attitudes and academic performance.

Educators need more. They need more knowledge and skills, time, teaching resources, space, and support from their administration and the wider community. This study has shown that they are already going far above and beyond, in their classrooms and at home, in trying to provide a good education for their learners, under very difficult circumstances, with little support. This is an unsustainable situation, and the study has also clearly shown what mathematics educators in the intermediate phase say they need in order to ensure that all learners are successful, regardless of their needs and diversity. It is time now for the DoE, the school administrative system and the parent community to step up and demonstrate that they too care about the success of South Africa‘s children.

REFERENCES

Anderson, P. (2016). *Considerations on western Marxism*. London: Verso Books.

Angelova, V. (2014). Aspects of teaching mathematics to gifted students in the context of inclusive education. *International Journal on New Trends in Education and Their Implications,* 5(3), Available at http://www.ijonte.org/FileUpload/ks63207/File/11.angelova.pdf (Accessed 3 October 2018).

Aronson, J. (1995). A pragmatic view of thematic analysis. *The Qualitative Report*, 2(1), 1–3, Available at https://arxiv.org/pdf/physics/0601009.pdf (Accessed 4 October 2017).

Babbie, E. (2011). *Introduction to social research*. 5th edition. Belmont, CA: Pearson.

Basit, T. N. (2010). *Conducting research in educational contexts*. London: Continuum International Publishing Group.

Bhattacherjee, A. (2012). *Social science research: Principles, methods, and practices*. 2nd edition. USF Tampa Bay Open Access Textbooks Collection. Book 3. Available at http://scholarcommons.usf.edu/oa_textbooks/3 (Accessed 7 October 2017).

Bird, C. M. (2005). How I stopped dreading and learned to love transcription. *Qualitative Inquiry*, 11(2), 226–248.

Boliver, V. (2011). Expansion, differentiation, and the persistence of social class inequalities in British higher education. *Higher Education*, 61(3), 229–242.

Bond, G., & Chernoff, E .J. (2015). Mathematics and social justice: A symbiotic pedagogy. *Journal of Urban Mathematics Education*, 8(1), 24–30.

Boston-Kemple, T. (2012). A conceptual analysis of key concepts in inclusive education. PhD (Doctor of Philosophy) thesis, University of Iowa.

Botha, J., & Kourkoutas, E. (2016). A community of practice as an inclusive model to support children with social, emotional and behavioural difficulties in school contexts. *International Journal of Inclusive Education*, 20(7), 784–799.

Bottge, B. A., Cohen, A. S., & Choi, H. J. (2018). Comparisons of mathematics intervention effects in resource and inclusive classrooms. *Exceptional Children*, 84(2), 197–212.

Bowie, L., & Reed, Y. (2016). How much of what? An analysis of the espoused and enacted mathematics and English curricula for intermediate phase student teachers at five South African universities. *Perspectives in Education*, 34(1), 102–119.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101.

Brynard, P. A. & Hanekom, S. X. (2006). *Introduction to research in management related fields*. 2nd edition. Pretoria: Van Schaik.

Carrim, N. (2002). *Inclusion/exclusion in South African education*. Sussex: Institute of Development Studies.

City Press. (2012). 1 in 6 matrics got less than 10% for maths. January 29, 2012. Available at https://www.news24.com/Archives/City-Press/1-in-6-matrics-got-less-than-10-for- maths-20150430 (Accessed 8 August 2018).

Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methods design*. Thousand Oaks, CA: Sage.

Creswell, J. W. (2012). *Educational research: Planning, conducting and evaluating quantitative and qualitative research*. 4th edition. London: Pearson.

Creswell, J. W., & Poth, C. N. (2017). *Qualitative inquiry and research design: Choosing among five approaches*. Thousand Oaks, CA: Sage.

De Boer, A., Pijl, S. J., & Minnaert, A. (2011). Regular primary schoolteachers‘ attitudes towards inclusive education: A review of the literature. *International Journal of Inclusive Education*, 15(3), 331–353.

Denzin, N. K., & Lincoln, Y. S. (Eds) (2005). *The Sage handbook of qualitative research*. Thousand Oaks, CA: Sage.

Department of Basic Education. (2011). *Curriculum and Assessment Policy Statement (CAPS), Mathematics: Further Education and Training Phase Grades 10–12*. Pretoria: Government Printing Works.

Department of Basic Education. (2014). *Report on the Annual National Assessments of 2014 (Grades 1–6 & 9).* 4 December 2014. http://www.saqa.org.za/docs/rep-annual/2014. REPORT%20ON%20THE%20ANA%20OF%202014.pdf

Department of Education. (2001). *Education White Paper 6: Special Needs Education: Building an inclusive education and training system.* Pretoria: Department of Education. Available at http://www.education.gov.za/Portals/0/ Documents/Legislation/White%20paper/Education%20%20White°/o20Paper°/o206 .pdf?ver=2008-03-05-104651-000 (Accessed 3 December 2018).

Diaz, L. (2017). The teaching and learning process of mathematics in the primary education stage: A constructivist proposal within the framework of key competences. *International Electronic Journal of Mathematics Education,* 12(3), 709–713

Eloff, I., Engelbrecht, P., Pettipher, O. R., & Swart, R. E. (2002). Implementing inclusive education in South Africa: Teachers‘ attitudes and experiences. *Acta Academica,* 34(1), 175–189.

Engelbrecht, P., Green, L., Naicker, S., & Engelbrecht, L. (1999). *Inclusive education in action in South Africa*. Pretoria: Van Schaik.

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), 1–4.

European Agency. (2015). *Empowering teachers to promote inclusive education: A case study of approaches to training and support for inclusive teacher practice*. Available at https://www.european-agency.org/sites/default/files/Empowering%20Teachers%20to%20 Promote%20Inclusive%20Education.%20A%20case%20study.pdf (Accessed 24 August 2018).

Evans, J. & Lunt, I. (2005). Inclusive education: are there limits? In: K. Topping & S. Maloney (eds), *The Routledge Falmer Reader in Inclusive Education* (pp. 41–54), Oxford: Routledge Falmer.

Evers, R., & Spencer, S. (2011). *Planning effective instruction for students with learning and behavior problems*. Columbus, OH: Merrill/Pearson.

Fernando, S., Yasmin, S., Minto, H., & Khan, N. (2010). Policy and practice in the educational inclusion of children and young people with visual impairment in Sri Lanka and Pakistan. *The Educator*, 22.

Gould, A., & Vaughn, S. (2000). Planning for the inclusive classroom: Meeting the needs of diverse learners. *Journal of Catholic Education*, 3(3), 363–374.

Guba, E.G. & Lincoln, Y.S. (1994). *Competing paradigms in qualitative research*. Newbury Park, CA: Sage.

Haciomeroglu, G. (2017). Reciprocal relationships between mathematics anxiety and attitude towards mathematics in elementary students. *Acta Didactica Napocensia*, 10(3), 59–68.

Hancock, B., Ockleford, E., & Windridge, K. (2007). *An introduction to qualitative research*. Trent: RDSU.

Hanna, G. S., & Dettmer, P. A. (2004). *Assessment for effective teaching: Using contextadaptive planning.* Boston, MA: Pearson A&B.

Haruthaithanasan, T. (2010). *The effects of experiences with constructivist instruction on attitudes toward democracy among Thai college students*. Doctoral dissertation, University of Missouri-Columbia.

Henning, E., Van Rensburg, W., & Smit, B. (2004). *Finding your way in qualitative research*. Pretoria: Van Schaik.

Hlalele, D. (2012). Exploring rural high school learners' experience of mathematics anxiety in academic settings. *South African Journal of Education*, 32(3), 267–278.

Howie, S. (2004). A national assessment in mathematics within an international comparative assessment. *Perspectives in Education*, 22(2), 149–162.

Hoy, A. W. (2008). What motivates teachers? Important work on a complex question. *Learning and Instruction*, 18(5), 492–498.

Izquierdo, E. E. (2008). *Impact of assessment of an educational intervention based on the constructivist paradigm on the development of entrepreneurial competencies in university students*. Unpublished PhD thesis (Applied Economics), Ghent University.

Jensen, M. D. (1998). *Courting serendipity: Constructivist theory and classroom practice*. Unpublished PhD thesis (College of Education and Human Services), University of South Florida. Available at http://digitalcommons.unf.edu/etd/136 (Accessed 7 October 2017).

Kakoma, L. (2016). Mathematics assessment at elementary level as informed by theoretical and teachers‘ perspective. *Jokull Journal*, 66(8), 92–108.

Khan, Y. (2017). *The great partition: The making of India and Pakistan*. New Haven: Yale University Press.

Kisanji, J. (1999). Models of inclusive education: Where do community-based support programmes fit in? Paper presented at the workshop on ―Inclusive Education in Namibia: The Challenge for Teacher Education‖, 24-25 March 1999, Rossing Foundation, Khomasdal, Windhoek, Namibia.

Konza, D. (2008). Inclusion of students with disabilities in new times: responding to the challenge. In P. Kell, W. Vialle, D. Konza, & G. Vogl (Eds.), *Learning and the learner: Exploring learning for new times.* Wollongong: University of Woolongong.

Kothari, C. R. (2004). *Research methodology: Methods and techniques.* 2nd edition. New Delhi: New Age International Publishers.

Kussumua, I. (2007). *A constructivist learning event using computers at the Instituto Superior de Ciências de Educação (ISCED) – Angola*. Unpublished Magister Educationis in Computer-Integrated Education (Department of Curriculum Studies, Faculty of Education), University of Pretoria.

Ladbrook, M. W. (2009). *Challenges experienced by educators in the implementation of inclusive education in primary schools in South Africa*. Unpublished Master of Education dissertation. University of South Africa, Pretoria.

Lalvani, P. (2014). The enforcement of normalcy in schools and the disablement of families: Unpacking master narratives on parental denial. *Disability & Society*, 29(8), 1221–1233.

Lapadat, J., & Lindsay, A. (1999). Transcription in research and practice: From standardization of technique to interpretive positionings. *Qualitative Inquiry*, 5(1), 64–86.

Larvor, B., & Francois, K. (2018). The concept of culture in critical mathematics education. In: Ernest P. (ed) *The philosophy of mathematics education today*. ICME-13 Monographs. Cham:Springer

Leedy, P. D. (1993). *Practical research: Planning and design*. 5th edition. New York: Macmillan Publishing Company.

Leedy, P. D. & Ormrod, J. E. (2010). *Practical research: Planning and design*. 9th edition. New Jersey: Merrill, Upper Saddle River Prentice Hall.

Legotlo, M. W. (Ed.). (2014). *Challenges and issues facing the education system in South Africa*. Johannesburg: Africa Institute of South Africa.

Liasidou, A. (2012). *Inclusive education, politics and policymaking*. New York: Bloomsbury Publishing.

Loyens, S. M., Rikers, R. M., & Schmidt, H. G. (2009). Students‘ conceptions of constructivist learning in different programme years and different learning environments. *British Journal of Educational Psychology*, 79(3), 501–514.

Mackey, A. (2012). *Input, interaction and corrective feedback in L2 learning*. Oxford: Oxford University Press.

Madihlaba, S. J. (2013). *Supporting foundation phase learners with mathematical problems in the Bojanala District, North West*. Unpublished Doctoral dissertation, University of South Africa.

Mahlo, F. D. (2011). *Experiences of learning support teachers in the foundation phase*. Unpublished Doctoral dissertation, University of South Africa.

Maja, M. M. (2015). *Classroom interaction in teaching English First Additional Language learners in the Intermediate Phase*. Unpublished Doctoral dissertation (Curriculum Studies), University of South Africa.

Major, T. E., & Mangope, B. (2012). The constructivist theory in mathematics: The case of Botswana primary schools. *International Review of Social Sciences and Humanities*, 3(2), 139–147.

Maree, K. (2014). *First steps in research*. 14th edition. Pretoria: Van Schaik

Marishane, M. A., Marishane, R. N. & Mahlo, F. D. (2015). Teacher capacity for curriculum differentiation in teaching foundation phase mathematics. *International Journal of Science Education*, 11(3), 253–262.

Martin, M. O., Mullis, I. V., Foy, P., & Stanco, G. M. (2012). *TIMSS 2011 International Results in Science*. Amsterdam: International Association for the Evaluation of Educational Achievement.

Mathibe, I. (2007). The professional development of school principals. *South African Journal of Education*, 27(3), 523–540.

Mattar, J. (2018). Constructivism and connectivism in education technology: Active, situated, authentic, experiential, and anchored learning. *RIED*, 21(2), 201–217.

Mayaba, P. L. (2008). *The educators' perceptions and experiences of inclusive education in selected Pietermaritzburg schools*. Unpublished Master's thesis (School of Psychology), University of KwaZulu-Natal.

McMillan, J. H., & Schumacher, S. (2010). *Research in education: Evidence-based inquiry*. London: Pearson.

Mhlolo, M. K. (2011). *From coherence in theory to coherence in practice: A stock-take of the written, tested and taught National Curriculum Statement for Mathematics (NCSM) at Further Education and Training (FET) level in South Africa*. Unpublished Doctoral thesis (Wits School of Education), University of the Witwatersrand.

Mitiku, W., Alemu, Y., & Mengsitu, S. (2014). Challenges and opportunities to implement inclusive education. *Asian Journal of Humanity, Art and Literature*, 1(2). Available at https://journals.abc.us.org/index.php/ajhal/article/view/Mitiku (Accessed 3 October 2017).

Mittler, P. (2005). The role of the United Nations. In D. Mitchell (Ed.), *Contextualising inclusive education*. London: Routledge.

Mohanty, S. P., & Nanda, N. (2017). Inclusive practices in elementary education: What do the heads of schools perceive? *i-managers: Journal on School Educational Technology*, 12(4), 15–23.

Moloi, M., & Kanjee, A. (2018). Beyond test scores: A framework for reporting mathematics assessment results to enhance teaching and learning. *Pythagoras*, 39(1), 1–14.

Monsen, J. J., Ewing, D. L., & Kwoka, M. (2014). Teachers‘ attitudes towards inclusion, perceived adequacy of support and classroom learning environment. *Learning Environments Research*, 17(1), 113–126.

Moscardini, L. (2014). Developing equitable elementary mathematics classrooms through teachers learning about children‘s mathematical thinking: Cognitively guided instruction as an inclusive pedagogy. *Teaching and Teacher Education*, 43, 69–79.

Motitswe, J., & Mokhele, M. (2013). Teaching and learning in the inclusive classroom: What foundation phase teachers do? *Mediterranean Journal of Social Sciences*, 4(6), 545– 551.

Mpya, G. (2007). *Managing inclusive education in the classroom with reference to the Nkangala region in Mpumalanga*. Unpublished Master‘s dissertation, University of South Africa.

Mulaudzi, N. O. (2016). Second language as a barrier to mathematics achievement in foundation phase schools of Vhuronga in South Africa. *Journal of Educational Studies*, 15(2), 162–179.

Mullis, I. V. S., Martin, M. O., Foy, P., & Hooper, M. (2016). *TIMSS 2015 International Results in Mathematics*. Available at http://timssandpirls.bc.edu/timss2015/internationalresults/ (Accessed 3 July 2018).

Munyoro, G. (2014). The effectiveness of e-learning in higher education: A case study of University of Dundee, Scotland, United Kingdom. *ADRRI Journal of Arts and Social Sciences*, 1(1), 1.

Muringi, L. N. (2015). Inclusive basic education in South Africa: Issues in its conceptualisation and implementation. *Potchefstroom Electronic Law Journal/Potchefstroomse Elektroniese Regsblad (PER/PELJ)*, 18(1), 3160–3195.

Mushtaq, I. & Khan, S. N. (2012). Factors affecting students‘ academic performance. *Global Journal of Management and Business Research*, 12(9), 17–22.

Naicker, S. M. (2000). From apartheid education to inclusive education: The challenges of transformation. In: Proceedings of the International Education Summit for a Democratic Society, 26–28 June 2000, Detroit: Wayne State University, pp. 1–13.

Naidoo, L. (2010). *The role of the educator in addressing the needs of orphans and vulnerable children*. Unpublished Doctoral thesis (Educational Psychology), University of Zululand.

National Council of Teachers of Mathematics. (2014). *Principles to actions: ensuring mathematical success for all*. Reston, VA: National Council of Teachers of Mathematics.

Naude, M., & Meier, C. (Eds) 2014. *Teaching foundation phase mathematics*. Pretoria: Van Schaik.

Nel, N., Krog, S., Mohangi, K., Muller, H., & Stephens, O. (2016). Research partnership between South Africa and China: Emergent literacy teaching and learning in early childhood education in South Africa. *Per Linguam*, 32(1), 102–122.

Nel, N., Nel, M., & Hugo, A. (Eds.). (2013). *Learner support in a diverse classroom: A guide for foundation, intermediate and senior phase teachers of language and mathematics*. Pretoria: Van Schaik Publishers.

Neo, M., & Neo, T. (2009). Engaging students in multimedia-mediated constructivist learning – Students‘ perceptions. *Journal of Educational Technology & Society*, 12(2), 254–266.

Ntombela, S. (2011). The progress of inclusive education in South Africa: Teachers‘ experiences in a selected district, KwaZulu-Natal. *Improving Schools*, 14(1), 5–14.

Ntuli, E., & Traore, M. (2013). A study of Ghanaian early childhood teachers‘ perceptions about inclusive education. *The Journal of the International Association of Special Education*, 14(1), 50–57.

Ollerton, M. (2009). *The mathematics teacher’s handbook*. London: Continuum.

Owen-Smith, M. (2010). The language challenge in the classroom. *Focus: Journal of the Helen Suzman Foundation*, 56, 31–37.

Patton, M. & Cochran, M. (2002). *A guide to using qualitative research methodology*. Paris: Médecins Sans Frontières.

Pennington, M. C., & Richards, J. C. (2016). Teacher identity in language teaching: Integrating personal, contextual, and professional factors. *RELC*, 47(1), 5–23.

Pijl, S. J., Meijer, C. J., & Hegarty, S. (Eds.). (1997). *Inclusive education: A global agenda*. London: Psychology Press.

Pinel, A. (2017). The role of geometry in fashioning an inclusive mathematics education. *Mathematics Teaching*, 259. Available at https://www.atm.org.uk/Mathematics-TeachingJournal-Archive/141018 (Accessed 14 October 2017).

Poland, B. D. (1995). Transcription quality as an aspect of rigor in qualitative research. *Qualitative Inquiry*, 1(3), 290–310.

Polat, F. (2011). Inclusion in education: A step towards social justice. *International Journal of Educational Development*, 31(1), 50–58.

Punch, K. F. (2006). *Developing effective research proposals*. London: Sage.

Purcaru, M. A. P., & Unianu, E. M. (2015). Teaching mathematics for children with SEN: Good practice examples. *Journal Plus Education*, Special issue, 64–67.

Rajasekar, S.; Philominathan, P.; & Chinnathambi, V. (2013). Research methodology. Available at https://arxiv.org/pdf/physics/0601009.pdf (Accessed 4 October 2017).

Raoano, M. J. (2016). *Improving learners' mathematics problem solving skills and strategies in the intermediate phase: A case study of primary school in Lebopo Circuit*. Unpublished Doctoral dissertation, University of Limpopo.

Riessman, C. K. (1993). Narrative analysis. In: N. Kelly, C. Horrocks, K. Milnes, B. Roberts & D. Robinson (Eds), Narrative, Memory & Everyday Life. Huddersfield: University of Huddersfield, pp. 1–7.

Roos, H. (2018). The influence of assessment on students' experiences of mathematics: Students' and teachers' values, attitudes, feelings and beliefs in mathematics classrooms. Selected papers from the 22nd MAVI Conference, pp. 101–111.

Saunders, M., Lewis, P., & Thornhill, A. (2007). *Research methods for business students* 4th edition. London: Pearson Education.

Sharma, U., & Nuttal, A. (2016). The impact of training on pre-service teacher attitudes, concerns, and efficacy towards inclusion. *Asia-Pacific Journal of Teacher Education*, 44(2), 142–155.

Sheinuk, C. S. (2010). Intermediate phase mathematics teachers' reasoning about learners' mathematical thinking. Unpublished Master's research report (Wits School of Education), University of the Witwatersrand.

Simons, P. R. J. (1993). Constructive learning: The role of the learner. In T. Duffy, J. Lowyck, and D. Jonassen (Eds.), *Designing environments for constructive learning* (pp. 91–313). Berlin: Springer.

Singh R. P., & Rana, G. (2004). *Teaching strategies*. New Delhi, India: APH Publishing.

Slee, R. (2011). *The irregular school: Exclusion, schooling and inclusive education*. London: Routledge.

Srivastava, M., de Boer, A., & Pijl, S. J. (2013). Inclusive education in developing countries: a closer look at its implementation in the last 10 years. *Educational Review*, Published online 1 November 2013, http://dx.doi.org/10.1080/00131911.2013.847061

Stiff, L. V. (2001). Constructivist mathematics and unicorns. NCTM News Bulletin, July/August 2001. Available at https://www.nctm.org/News-and-Calendar/Messages-fromthe-President/Archive/Lee-V_-Stiff/Constructivist-Mathematics-and-Unicorns/ (Accessed 21 August 2018).

Stockall, N. (2013). Photo-elicitation and visual semiotics: A unique methodology for studying inclusion for children with disabilities. *International Journal of Inclusive Education*, 17(3), 310–328.

Stoltz, J. M. (2016). Promoting reading development of beginner readers in the Umlazi District of KwaZulu-Natal. Unpublished Master‘s thesis, University of South Africa.

Tan, P. (2017). Advancing inclusive mathematics education: Strategies and resources for effective IEP practices. *International Journal of Whole Schooling*, 13(3), 28–38.

Taweechaisupapong, M. (2015). Teachers‘ views about teacher training towards inclusive education. Unpublished Master‘s dissertation (Department of Special Needs Education), University of Oslo.

Taylor, P. C., & Medina, M. N. D. (2013). Educational research paradigms: From positivism to multiparadigmatic. *Journal for Meaning-Centered Education*, 1. Available at http://www.meaningcentered.org/journal/volume-01/educational-research-paradigms-frompositivism-tomultiparadigmatic/ (Accessed 4 October 2017).

Terre Blanche, M., & Durrheim, K. (1999). *Research in practice: Applied methods for the social sciences*. Cape Town: University of Cape Town Press.

Terre Blanche, M., Durrheim, K., & Painter, D. (eds.) (2009). *Research in practice: Applied methods for the social sciences*. 2nd edition. Cape Town: University of Cape Town Press.

Thomas, D. R. (2003). A general inductive approach for qualitative data analysis. *American Journal of Evaluation*, 27, 237.

Thorne, J. A. (2013). Biblical online education: Contributions from constructivism. *Christian Education Journal*, 10(1), 99–109.

Troudi, S. (2010). Paradigmatic nature and theoretical framework in educational research. In M. Al-Hamly, C. Coombe, P. Davidson, A. Shehada (Eds.), *English in learning: Learning in English*, pp. 315–323, Dubai: Tesol Arabia Publications.

UNESCO-IBE, 2014. Moving towards inclusive approaches to learning: addressing learners‘ diverse expectations and needs. International Expert Meeting. Paris, 19–20 June 2014.

United Nations Educational, Scientific and Cultural Organization (UNESCO). (1994a). *Final report: World conference on special needs: Access and quality*. Paris: UNESCO.

United Nations Educational, Scientific and Cultural Organisation (UNESCO). (1994b). T*he Salamanca statement and framework for action on special needs education*. World Conference on Special Needs Education: Access and Equality, Salamanca, Spain, 7–10 June, 1994. Available at http://www.unesco.org/education/pdf/SALAMA_E.PDF (Accessed 23 October 2018).

United Nations Educational, Scientific and Cultural Organization (UNESCO). (2002). *Inclusive schools and community support programmes: Report phase two 1999–2002*. Paris: UNESCO.

United Nations Educational, Scientific and Cultural Organization (UNESCO). (2003). *Overcoming exclusion through inclusive approaches in education: A challenge and a vision, conceptual paper*. Paris: UNESCO.

Van der Berg, S. (2015). What the Annual National Assessments can tell us about learning deficits over the education system and the school career. *South African Journal of Childhood Education*, 5(2): 28–43.

Verma, G. K., & Mallick, K. (1999). *Researching education: Perspectives and techniques*. Philadelphia: Open University Press.

Victoroff, K. Z., & Hogan, S. (2006). Students‘ perceptions of effective learning experiences in dental school: A qualitative study using a critical incident technique. *Journal of Dental Education*, 70(2), 124–132.

Visser, T. (2002). *Personality traits of learners with special education needs: Implementations in an inclusive education setting*. Unpublished Master‘s dissertation, University of South Africa.

Walton, E., Nel, N., Hugo, A., & Muller, H. (2009). The extent and practice of inclusion in independent schools in South Africa. *South African Journal of Education*, 29(1), 105–126.

Walton, E., Nel, N. M., Muller, H., & Lebeloane, O. (2014). ‗You can train us until we are blue in our faces, we are still going to struggle‘: Teacher professional learning in a full service school. *Education as Change*, 18(2), 319–333.

Walqui, A. (2006). Scaffolding instruction for English language learners: A conceptual framework. *The International Journal of Bilingual Education and Bilingualism*, 9(2), 159– 180.

Weeks, F. H. & Erradu, J. (2013). The intellectually impaired foundation-phase learner: How can the teacher support these learners? *South African Journal of Education*. 10(1), 1–16.

Welman, J. C., Kruger, S. J. & Mitchell, B. (2005). *Research methodology*. 3rd edition. Cape Town: Oxford University Press.

White, C. J. (2013). Higher education emotions: A scale development exercise. *Higher Education Research & Development*, 32(2), 287–299.

Woolfolk, A. (2007). *Educational psychology*. Boston: Pearson Education.

APPENDICES

APPENDIX A: PERMISSION LETTER

education

Department:
Education
PROVINCE OF KWAZULU-NATAL

Enquiries: Phindile Duma | Tel: 033 392 1063 | Ref.:2/4/8/1555

Ms NPP Msomi
217 KwaMakhutha
Durban
4066

Dear Ms Msomi

PERMISSION TO CONDUCT RESEARCH IN THE KZN DoE INSTITUTIONS

Your application to conduct research entitled: **"EXPLORING INCLUSIVE PRACTICES IN THE INTERMEDIATE PHASE MATHEMATICS CLASSROOM"**, 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 01 June 2018 to 01 October 2020.
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 below.
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

Dr. EV Nzama
Head of Department: Education
Date: 19 June 2018

KWAZULU-NATAL DEPARTMENT OF EDUCATION
Postal Address: Private Bag X9137 • Pietermaritzburg • 3200 • Republic of South Africa
Physical Address: 247 Burger Street • Anton Lembede Building • Pietermaritzburg • 3201
Tel.: +27 33 392 1063 • **Fax.:** +27 033 392 1203• **Email:**Phindile.Duma@kzndoe.gov.za •**Web:**www.kzneducation.gov.za
Facebook: KZNDOE....Twitter: @OBE_KZN....Instagram: kzn_education....Youtube:kzndoe

APPENDIX B: ETHICS CLEARANCE CERTIFICATE

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

20 June 2018

Ms Nosipho Phumelele Princess Msomi (217078616)
Scool of Education
Edgewood Campus

Dear Ms Msomi,

Protocol reference number: HSS/0412/018M
Project Title: Inclusive Education practices in the Intermediate Phase Mathematics classroom

Approval Notification – Expedited Application

In response to your application received 03 May 2018, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application 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.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

Professor Shenuka Singh (Chair)

/ms

Cc Supervisor: Dr V Jairam
Cc Academic Leader Research: Dr SB Khoza

Dr. EV Nzama
Head of Department: Education
Date: 19 June 2018

KWAZULU-NATAL DEPARTMENT OF EDUCATION — Championing Quality Education - Creating and Securing a Brighter Future

Cc School Administrator: Ms Tyzer Khumalo

Humanities & Social Sciences Research Ethics Committee
Professor Shenuka Singh (Chair)
Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban 4000
Telephone: +27 (0) 31 260 3587/8350/4557 **Facsimile:** +27 (0) 31 260 4609 **Email:** ximbap@ukzn.ac.za / snymacm@ukzn.ac.za / mohunp@ukzn.ac.za
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APPENDIX C: GATEKEEPER PERMISSION LETTER

DEAR SIR/MADAM

REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT YOUR SCHOOL

I am Nosipho Phumelele Msomi and I am conducting a research as a requirement of the University of KwaZulu-Natal towards a Degree of Masters in Educational Psychology. My student number: 217078616. I am required to carry out research to write up a thesis. Your school has been selected to participate in this research project. The title of the research study is‖ Inclusive practices in the intermediate phase mathematics classroom‖ The importance of this study is as follows:

- This study will establish how educators perceive inclusive education in the intermediate phase mathematics classroom.
- The study will also determine the role of educators in promoting inclusive education practices in the intermediate phase when teaching mathematics.
- The findings can be used to understand strategies that can be employed to enhance and promote inclusive education in mathematics.
- The study can also assist in providing recommendations on how inclusive education practices can be improved in the intermediate phase mathematics classroom.

The study requires the participation of teachers in interviews, questionnaires and classroom observation. Participation is purely voluntary, and participants can withdraw from the study at any time if they wish and no harm will befall them. I will observe maximum respect to your institution and participants‘ anonymity and confidentiality will be maintained throughout the study as well as in reporting the findings. Information will be made available to all participants before publication of the study. Information will be stored in a safe and secure storage and discarded after five years.

I can be contacted at:

Email: noziphosingila@gmail.com
Cell: 0791290667

My supervisor is Dr. V. Jairam who is located at the Department of Educational Psychology, Edgewood campus of the University of KwaZulu-Natal.

DECLARATION

I _____ (Full names of principal) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent this research to take place in my school.

SIGNATURE OF THE PRINCIPAL DATE

_____ _____

School stamp

APPENDIX D: INFORMED CONSENT LETTER

1. Nature of the research project

Researcher	Name: Nosipho Phumelele Princess Msomi Qualifications: Honours degree in Inclusive Education Telephone No: 0791290667 E-mail: noziphosingila@gmail
Supervisor	Name: DR Jairam Qualifications: PHD (Educational Psychology) Telephone No: 031 2601438 E-mail: jairam@ukzn.ac.za
Purpose	To evaluate the educators‘ perceptions and practices of inclusive education in the intermediate phase mathematics classroom.

2. What is required of participants?

I understand that:

- My participation in the research is voluntary and subject to informed consent.

- I can withdraw from the research process at any time.
- My participation in the research will not affect my position as a teacher or my relationship with other teachers at school.
- Participants‘ rights will be respected.
- The information obtained will be used with the strictest of confidentiality.
- I can refuse to answer any questions asked to me.
- The researcher will use information from me in a way that will assure my continued respect amongst other learners, colleagues and the wider fraternity.
- My identity will not be disclosed in the thesis.
- Photographs/videos of me will not be used in this thesis or any display related to the research.
- The research will not impact on my working time.

3. Declaration:

I _____ (name of participant) have been approached to participate in the research entitled: **Inclusive practices in the intermediate phase mathematics classroom.** I hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project. I understand that I am at liberty to withdraw from the project at any time.

I **agree** to participate in a study that Nosipho Phumelele Msomi is conducting.

Name of participant: _____

Signature: _____

Date: _____

APPENDIX E: LETTER OF REQUEST FOR TEACHERS' PARTICIPATION

Dear Participants

My name is Nosipho Phumelele Msomi. I am a current Masters student from the University of KwaZulu-Natal, registration number is 217078616. I am engaged in research work concerning educators' perception and practices of inclusive education in the intermediate phase mathematics classroom. I have selected a school in Umlazi district as the study site. The title of my research is: Inclusive practices in the intermediate phase mathematics classroom.

The importance of this study is as follows:

- This study will establish how educators perceive inclusive education in the intermediate phase mathematics classroom.
- The study will also determine the role of educators in promoting inclusive education practices in the intermediate phase when teaching mathematics.
- The findings can be used to understand strategies that can be employed to enhance and promote inclusive education in mathematics.
- The study can also assist in providing recommendations on how inclusive education practices can be improved in the intermediate phase mathematics classroom.

I promise that:

- All the information will be kept confidential and will not be disclosed to parents or school management team. The only person with access to information will be Dr Visvaranie Jairam (PHD supervisor) and I.
- All written reports and accounts of this study will not reveal the school or people involved in the study.
- The information gathering process will not harm or deform characters of the participants.
- The data generating process will not put research site into disrepute.

Should you require any additional clarification about the study please contact me on 079

1290667 or E-mail: noziphosingila@gmail.com

Thank you

Nosipho Phumelele Msomi

Student number: 217078616

APPENDIX F: INTERVIEW SCHEDULE

Interview with: _____

Gender: _____ Age: _____ Contact no: _____

Date of interview: _____ Place: _____

Interview conducted by: _____

1. What are your perceptions about inclusive education in the intermediate phase?
2. How do you ensure that your lessons are inclusive enough during teaching and learning?
3. Do you have difficulties in ―Inclusive education implementation‖ during teaching and learning? (Why?)
4. Do you feel that the training you receive during capacity building workshops, equipped you with the necessary skills? (How?)
5. How do you best make sure that inclusive education is enhanced?
6. What is your most single attribute in ensuring that inclusive education is being promoted in your phase?
7. What difficulties have you experienced in terms of enhancing inclusive education since you started teaching mathematics?
8. Which mechanisms must be used in order for you to achieve desired results?
9. Which mechanisms must be used for you to achieve desired results? How?
10. Do you think an inclusive policy in our mainstream schools is adequate to address all challenges related to inclusive education?
11. Has there been enough willingness both from the government and educators to make inclusive education a practical and well implemented reality?

APPENDIX G: QUESTIONNAIRE

Title: *Inclusive Education Practices in the Intermediate Phase Mathematics Classroom*

Please tick √ where options are provided and fill the blank spaces.

I am fully aware that I am a voluntary participant in this study: Yes ___ No ___

Section A

1. Total number of teaching experience _____
2. Number of years teaching mathematics _____
3. Number of years in the intermediate phase _____
4. Grade currently teaching _____
5. Academic qualifications _____
6. Age _____

Section B

1. What do you understand by the term inclusive education?

_____

_____

_____

2. What is the role of an educator in inclusive education?

_____

_____

_____

3. What are important pillars in inclusive education?

_____

_____

_____

4. What are the common mathematical barriers that learners face in your class?

_____

_____

_____

5. What assists or guides you when working with learners with barriers to mathematics?

_____

_____

_____

6. What kind of resources do you perceive as a core in the inclusive mathematics classroom?

_____

_____

APPENDIX H: EDITOR'S CERTFICATE

P.O. Box 100715
Scottsville
3209 28 January, 2019

To whom it may concern,

I have edited the following document for language errors, and in the process have checked the referencing and layout:

Title: *Exploring inclusive practices in the intermediate phase mathematics classroom at Umlazi District.*

Author: Nosipho Msomi

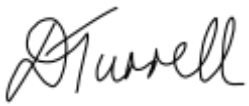
Degree: Master of Education (Educational Psychology)

Institution: University of KwaZulu-Natal

Student number: 217078616

Supervisor: Dr V. Jairam

Please feel free to contact me should you have any queries.

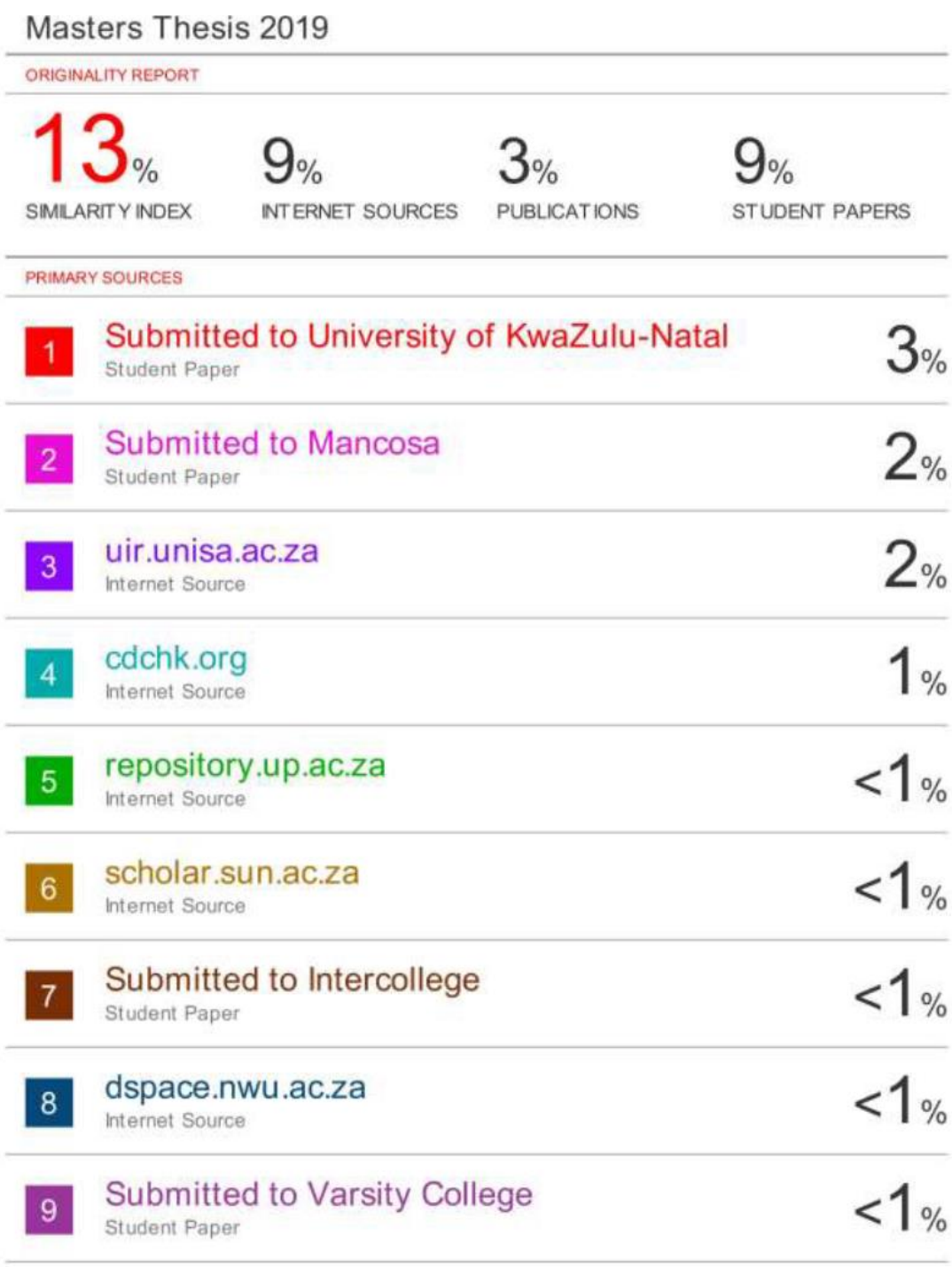


Kind regards,

Debbie Turrell

debbie.turrell@gmail.com

APPENDIX I: TURNITIN REPORT



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ORIGINALITY REPORT

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