

**Exploring secondary (9, 10 & 11) Mathematics and Science teachers' usage
of the curriculum tracker in Pinetown and King Cetshwayo districts**

By

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DECLARATION

I, Njabulo Happyboy Dube, declare that:

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SUPERVISION STATEMENT

This dissertation has been submitted with/ without my approval

.....

Dr Zanele Ndlovu

.....

Date

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DEDICATION

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ABSTRACT

In this study, the researcher explored secondary (9, 10 & 11) Mathematics and Science teachers' usage of the curriculum tracker in Pinetown and King Cetshwayo districts. This study aimed at gaining a better understating of the usage of curriculum tracker in secondary schools. In 2015 curriculum tracker was introduced in two districts Pinetown and King Cetshwayo for the purpose of assisting teachers in curriculum coverage and for HODs to have a professional conversation with teachers. Therefore, the researcher decided to carry out this study to explore the usage of the curriculum tracker in secondary schools. Focus was on grades 9, 10 and 11. This study is qualitative and was carried out in six schools, three from Pinetown and three from King Cetshwayo district. Primary data was collected from mathematics and science teachers and from HODs through semi-structured interviews and secondary data was collected by PILO coaches in 2015 and 2016.

The study is underpinned by the Whole Teacher Approach, which explores the teacher attitude, skills and practices of using the curriculum tracker. It was discovered in this study that the teachers were using the curriculum tracker but still lacked the knowledge and purpose of the curriculum tracker. During the interviews it was noted the teachers' attitudes towards the curriculum tracker played a crucial role in either usage or non-usage. Most of the teachers that participated in this study felt that the curriculum tracker increased the paper work. However, the responses from teachers and HODs assisted the researcher in identifying the enabling factors and challenges associated with the curriculum tracker. The study concludes that HODs have knowledge of the curriculum tool and some are utilising the curriculum tool to track curriculum coverage in the success as compared to maths. Although the tools were used to track curriculum coverage there was lack of evidence showing of professional conversation taking place between teachers and HODs. The study also advances several recommendations for the teachers, HODs and as well as the department of education. The study recommends that the head of departments and teachers in the schools must be given enough support to implement Jiki imfundo successful in the schools.

LIST OF ABBREVIATIONS

ATP	Annual Teaching Plan
CAPS	Curriculum and Assessment Policy Statement
PILO	Programme to improve learning outcomes
MT	Mathematics Teacher
ST	Science Teacher
HOD	Head of Department
SMT	School Management Team
DBE	Department of Basic Education
SGB	School Governing Body
TIMMS	Trends in international Mathematics and Sciences
ANA	Annual National Assessment
NCS	National Curriculum Statement
PISA	Programme for International Student Assessment
RNCS	Revised National Curriculum Statement
C2005	Curriculum 2005
KC	King Cetshwayo
KZN	KwaZulu-Natal
CT	Curriculum Tracker
TPD	Teacher Professional Development
NGO	Non-Governmental Organisation
DOE	Department of Education
GDE	Gauteng Department of Basic Education
KDE	KwaZulu-Natal Department of Basic Education
IQMS	Integrated Quality Management System

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CHAPTER ONE:

INTRODUCTION AND BACKGROUND OF THE STUDY

1.1 Introduction

The formation of the schooling system differs from country to country. Although it differs, its ultimate goal is to ensure that effective education is provided. In South Africa, the dominant school structure in public schools includes the school management team (SMT), which consists the principal, deputy principal, and Heads of Departments (HODs) in charge of different subject areas. Depending on student numbers, some schools have two Deputy Principals. Each school then consists of teachers and learners. Among other structures that contribute to the running of the school is the School Governing Body (SGB). The SGB consists of the Principal and elected parents, teachers, non-teacher staff and, in secondary schools, it also includes learners. All these bodies have the same mandate to ensure the effective functioning of the school. Van der Berg, Taylor, Gustafsson, Spaull, and Armstrong (2011) stress that effective schools require well-selected individuals as principals, together with management teams that understand and fulfil their roles as leaders of the curriculum, and ensuring that an organized environment conducive for learning is present. While all these bodies are, among other things, expected to ensure the effective functioning of the schools, the teachers and Heads of departments are the people at the ground level and who are expected to implement and manage the curriculum. Effective implementation of the curriculum requires support and monitoring; however, in the past there has been excessive monitoring, with limited support (Reinke, Herman, & Stormont, 2013). One of the causes of this lack of support is, evidently, the top-down approach in the South African Education, where policies are designed and decided on by various experts and filtered down to school for teachers and HODs to implement. In order to ensure that implementation takes place, constant monitoring is central. While monitoring is necessary, support should precede monitoring.

Education for all is a global commitment to provide quality basic education to all children (Darling-Hammond, 2015). Education is a basic human right and a significant factor in the development of children, communities, and countries. According to Türkahraman (2012), the primary aim of education is to sustain individual and societal improvement. The author further

states that the educational programs and policies play a key role in this social and individual progress. Education enables people to develop analytical skills and cognitive abilities, and also teaches children to analyse information and to exploit this acquired knowledge (Kiggundu & Nayimuli, 2009). Bhardwaj (2016) posits that education is the vehicle of knowledge, self-preservation, and success. Drawing from these authors, I posit that education not only gives us a platform to succeed but the knowledge of social conduct, strength, character, and self-respect. However, good education is premised on a well-structured curriculum and delivery of the curriculum depends on motivated teachers.

1.2 Background of the study

South African schools have been performing very poorly in recent years, and among the many reasons articulated in literature and departmental reports is the lack of curriculum coverage in schools. Curriculum coverage has been shown to be an important variable for explaining young pupils' academic progress (Plewis, 2010) and its lack thereof has been identified as detrimental to the education system. In the words of Bhardwaj (2016, p, 24);

Education is an essential human virtue, a necessity of society, the basis of good life and sign of freedom and education is important for the integration of separate entities.

While literature emphasises the importance of education for the success of the country, there has been evidence in the past and currently that the education system in South Africa is in crisis and interventions are a state of urgency. The major crisis has been strongly articulated in relation to mathematics and the sciences as there is an apparent relationship between mathematics competence and level of attainment and national development (Amin, 2012). Over the past years there has been an outcry regarding learner performance in mathematics, both at lower and higher levels as evident in Trends in International Mathematics and Science Study (TIMMS, 2015), Annual National Assessment (ANA, 2014), National Curriculum Statement (NCS, 2008), and the Programme for International Student Assessment (PISA, 2018) reports.

There have been many contributing factors associated with learner poor performance. Mji and Makgato (2006), Bansilal, Brijlall and Mkhwanazi (2014), Pournara, Hodgen, Adler, and Pillay (2015) point to teachers' lack of content knowledge, while others, such as Taylor (2012), Stols

(2013) and Department of Education reports (2014) point to lack of curriculum in the schools. To curb the crisis, many interventions have been implemented, mainly focusing on improving mathematics and science teachers' content knowledge. With respect to curriculum, there has been great emphasis in ensuring that the grade 12 (matric) curriculum is covered. Focusing on covering the grade 12 curriculum has been proven to be futile, especially in KwaZulu Natal and in other rural provinces like the Eastern Cape where learners continue performing poorly in mathematics and science as indicated by figure 1.1 and 1.2 below.

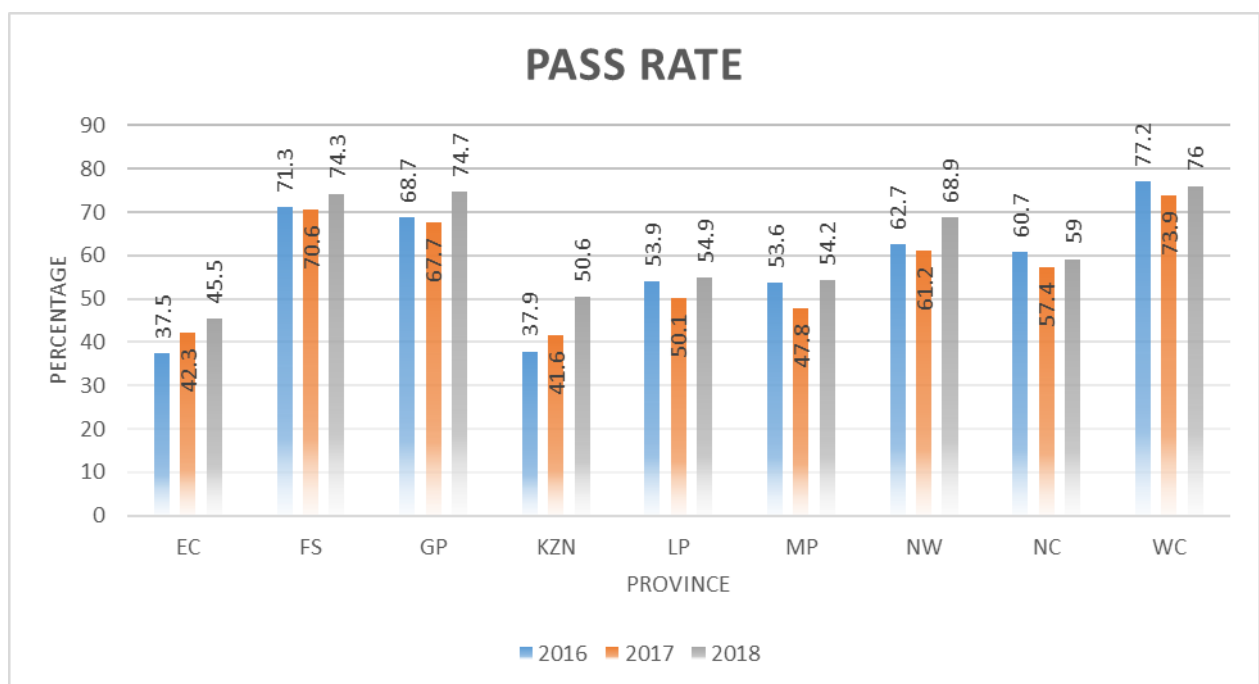


Figure 1.1: Provincial Mathematics results between 2016 and 2018

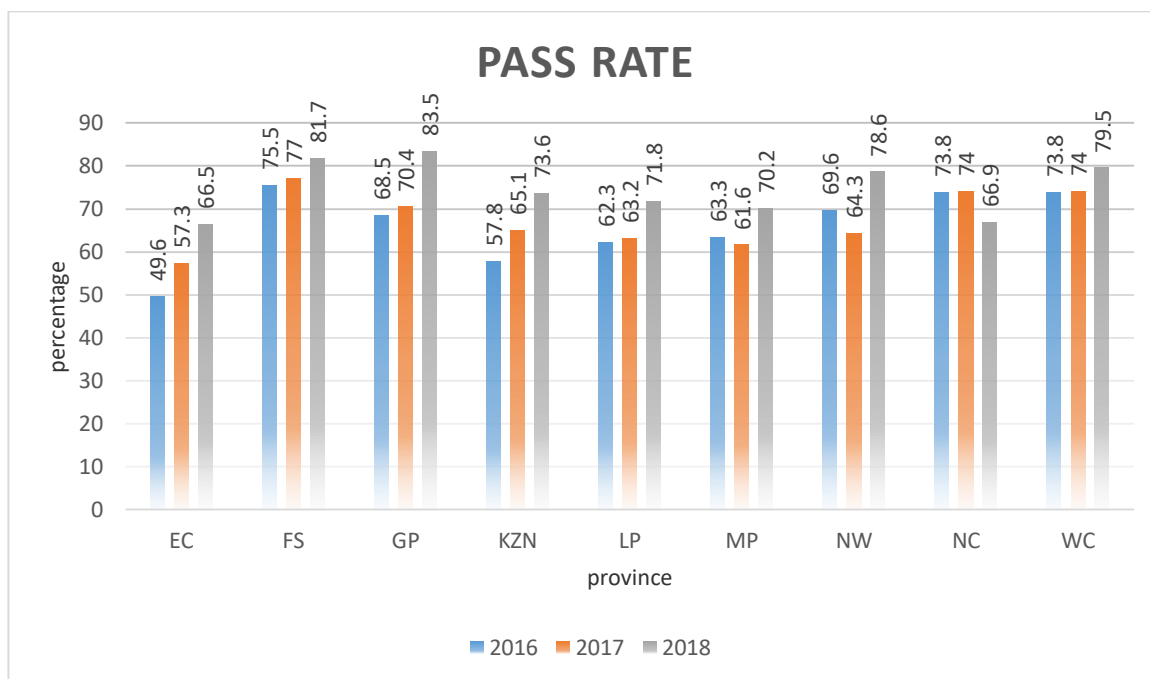


Figure 1.2: Province by province Physical sciences results since 2016 to 2018

In the post-1994 era, there has been a number of changes in curriculum, namely C2005, RNCS, NCS and CAPS. Within a period of fifteen years, all these had been tried and followed in South Africa. However, the issue with the lack of curriculum coverage has been constantly identified as the cause of poor performance. Instead of finding ways other than conducting teacher workshops to help teachers manage the curriculum, South Africa has undergone various transformations of the curriculum. However, the problem of lack of curriculum coverage has been persistent in all the curriculum transformations, including the Curriculum Assessment Policy Statement (CAPS).

Although training workshops were conducted when CAPS was introduced, there has been evidence that teachers are failing to manage the curriculum, and heads of departments are failing to track the curriculum for various reasons. For example, the depth of curriculum coverage is left at each teacher's discretion, the number of activities learners are exposed to depends on the textbook used by each teacher and their unpacking of the curriculum (Pournara et al., 2015). The teachers feel that the curriculum is too packed. For instance, in grade 9 there are 138 units to be covered in mathematics, including the workbook, in one year. Therefore, teachers end up picking and choosing from the curriculum since there was too much to be done in a short space of time. On the part of HODs, they focus on monitoring rather than

supporting teachers and some of them lack the expertise to track curriculum coverage since they are not experts in the field (McLaren, 2015).

With an aim to curb the crisis even in lower grades, in 2015, the Department of Education, together with Programme to Improve Learning Outcomes (PILO), introduced *Jika Imfundo*, which was aimed at addressing the lack of curriculum coverage in different phases. The different subjects targeted were Natural Science, English and Mathematics. Among other things, *Jika Imfundo* sought to provide district officials, teachers and School Management Teams with the tools and training needed to have professional and supportive conversations about curriculum coverage. *Jika Imfundo* was implemented based on the evidence that found that teachers were failing to finish the curriculum in schools. *Jika Imfundo* attempts to solve the problem of curriculum coverage and improve the learning outcomes across the system. The drive for *Jika Imfundo* is in line with the (Commission, 2007), which suggests that intervention should provide managers and teachers with practical guidelines on how to deal with poor performance. In addition, intervention strategies should address concerns in education and also help school managers to adopt a practical and consistent approach to the management of poor performance.

1.3 Statement of the problem

The study explores the extent to which teachers and HODs have used the curriculum tracker in Pinetown and King Cetshwayo districts. The researcher aimed at understanding mathematics and science teachers' as well as HODs' perspectives about the uptake of the curriculum tracker. Understanding teachers' and HODs' perspectives about interventions is critical since they are the ones supposed to implement it. Its success and failures depend on their uptake of the intervention and their uptake depends on their perspectives about the intervention. Understanding and implementing new interventions can be challenging to teachers (Van Hoorn, Monighan-Nourot, Scales, & Alward, 2014), therefore, it is important to explore the extent of the teachers' and HODs' uptake of the curriculum tracker as in the new intervention tool. The Curriculum tracker was first piloted in Pinetown and King Cetshwayo districts from 2015 to 2017. During this period, coaching and training on the use of the tools was done by PILO in partnership with the department of Education. In 2015 and 2016 PILO conducted surveys on the implementation of the of the curriculum tracker. The preliminary findings revealed low usage of the curriculum tracker by secondary school mathematics teachers and

HODs as compared to science teachers. However, the causes of such low usage were not established. While the reasons were not established, the programme was meant to be rolled out to other districts in 2018; therefore, the researcher deemed it necessary to conduct further research in order to establish the reasons contributing to low usage in order to impact the rollout of the programme. Furthermore, although preliminary findings suggest that science teachers know about the tool, it does not really show the extent of its usage, knowing and implementing are two different aspects. Therefore, in this research the aim was to explore the extent to which teachers and HODs were using the tools for the purpose that was intended, i.e. to track and manage the curriculum. There are also contradictory points about the preliminary findings as per the schooling system in South Africa. At secondary schools, there is one HOD for mathematics and Science; therefore, it is confusing that one HOD is able to help teachers utilise the tool to manage and track curriculum but the same HOD is failing to do the same in mathematics. Although HODs were trained on the use of the tool and had to train teachers, the preliminary findings are silent in terms of revealing whether training at school level did or did not take place. Secondly, the preliminary findings present data from the principals' and HODs' perspectives, with limited data drawn from teachers' perspectives as they are the ones using the curriculum tracker. Interest on the HODs was with how they are able to use the tools to manage the curriculum. It is, therefore, within these parameters that the researcher chose to explore teachers and HODs' uptake of the curriculum tracker to track and manage the curriculum. In order to understand the context of the introduction of the curriculum tracker, the next section elaborates on the aims of *Jika IMfundo*.

1.4 Aims of Jika Imfundo

Jika iMfundo works from the foundation to the FET phases by building routines and patterns of support within the schools that will have a long-term and sustained impact on learning outcomes. *Jika iMfundo* aims to achieve improvements in learning outcomes across the system by simultaneously focusing on the capacity of different levels of the system. The intervention also aims to enable districts to respond better to schools that need assistance, support school management teams to lead learning and to support the teacher in covering the curriculum, thereby helping pupils do better. The school and district are to monitor and respond to problems of curriculum coverage. The curriculum is the sum total of all the experience provided to the learners under the guidance of the school (Syomwene, 2013). If more learners have the

opportunity to learn successfully covering more of the curriculum, the more overall learning outcomes will improve.

Jika Imfundo seeks to provide district officials, teachers, and school management teams with the tools and training needed to have professional supportive conversations about curriculum coverage. *Jika Imfundo* curriculum trackers were developed in close consultation with the curriculum section of the Provincial Department. The *Jika Imfundo* curriculum tracker supports teachers by planning the coverage of the curriculum content each day and each week of each term, aligning the CAPS content planning to the textbook used, align planning to other available resources such as the DBE workbooks, track curriculum coverage by keeping a record for each class of when the learners have mastered content, reflect on curriculum coverage on a weekly basis and use the tracking to reflect, together with the learner, on work as part of an evidence-based one-on-one curriculum coverage conversation with the Head of department. It also increases access to support materials and strengthening school management by regularly checking the teachers' curriculum tracking and learners' work, work with the teachers to improve coverage and assist teachers with the problem in relation to the curriculum coverage.

1.4.1 Contents in the Curriculum Tracker (CT)

Instead of changing the curriculum, as has been the trend in the past, the department of education, in partnership with PILO, introduced the curriculum tracker in 2015 in the two districts of Pinetown and KC. The curriculum tracker was intended to help teachers plan and deliver the CAPS at the required pace, and set a basis for the work of tracking and monitoring teachers to work. It assists teachers by unpacking the CAPS into weekly and daily components, thus assisting teachers to know the depth of each topic. CT also track all the textbooks approved by Department of education and workbooks, thus assisting teachers to understand the need to find supplementary materials when need be. The curriculum tracker further put more emphasis on teacher reflections, guiding about what areas of reflections are critical. Teachers' reflections are intended to develop, in teachers, the capacity to monitor what and how their learners are learning. Teachers are expected to identify which learners struggle or need extra help in understanding the key concept being taught. Furthermore, the curriculum tracker and planner provides teachers with assessment tasks of different cognitive levels. In order to manage the curriculum, in addition to the curriculum tracker HODs are provided with tools to enhance professional conversation with teachers. The aim is to identify areas requiring support to improve teachers' curriculum coverage, and provides HODs with guiding techniques to help

with teachers' professional Development. Through this professional conversation, the aim is for teachers and HODs to identify and explore viable strategies of support to capacitate teachers and to address challenges associated with lack of curriculum coverage. The curriculum tracker is meant to improve curriculum coverage and to enhance teachers' and HODs' professional development. However, as literature points out that the uptake of innovations depend on teachers' persistence or lack (Davis & Krajcik, 2005). It is, therefore, within these parameters that this study sought to explore the secondary (grade 9, 10 & 11) Mathematics and Science teachers' and HODs' usage of the curriculum tracker in Pinetown and King Cetshwayo Districts in six schools in KwaZulu-Natal that were involved in the pilot project.

1.5 The aim and purpose of the study

The programme to improve learning Outcomes (PILO) is a multi-stakeholder, district-wide intervention. Its objective is to improve the district and school capacity to deliver the curriculum and subsequently bring about gains in learner outcomes. The programme focuses on teachers because they are the ones who are the implementers of the curriculum in schools. Among its broad goals, the programme is intended to support teachers and HODs to improve their practice when it comes to managing curriculum.

Unlike other initiatives that only target the so called-poor performing schools, the curriculum tracker was introduced to all schools regardless of context or quintiles because lack of curriculum coverage affects all schools in the KwaZulu-Natal province. In its initial stage, only two districts were selected to pilot the implementation of the curriculum tracker in all the phases except the Intermediate. The targeted subjects where lack of curriculum coverage has been evident were Natural Sciences, Physical Science, Mathematics and English at the secondary schools. In 2018 the department of education extended the project to other four districts and intends to extend it to all other districts. During its initial pilot period (2015-2017), PILO worked with schools and did surveys to explore the possibilities of extending the project to other districts. However, no in-depth study has been done to explore teachers' enabling factors and challenges with the usage of the curriculum tracker. Although preliminary findings showed that some teachers were using it and some were not, the reasons for those discrepancies in the usage of the curriculum tracker have not been explored by means of research. In a small scale study, Mkhwanazi, Ndlovu, Bansilal and Ngema (2017) explore grade 9 mathematics teachers' uptake of the tracker, leaving out the science teachers. Although they explored

teachers' uptake of the curriculum tracker, their study was on a small scale and did delve deeper into teachers' and HOD's HODs' perspectives. This study, therefore, aimed at extending these findings to include Science teachers and to explore the extent teachers and HODs have used the curriculum tracker to track and manage curriculum.

1.6 Rationale and motivation for the study

C Bertram and Christiansen (2014) describe a rationale or motivation for a study as the reasons or inspiring factors that influence the researcher to undertake a study. These factors can be personal, professional or academic. What triggered the undertaking of the study is actually those three factors as explained by Bertram et al (2014).

1.6.1 Academic motivation

The need for developing a provincial curriculum management strategy arises from a variety of factors that are directly related to curriculum delivery (DBE, 2014). The Curriculum Tracker was introduced as an intervention programme by Provincial Initiative to Improve Learning Outcomes (PILO) and Department of education to assist with curriculum coverage as it was evident in some departmental reports that one of the reasons for poor performance in mathematics is the lack of curriculum coverage (DBE, 2014). The PILO programme involves all stakeholders in the education sector, e.g. Circuit managers, Subject Advisors, School Management Teams, and teachers. For the purpose of the study, the focus was on teachers, who are the main people expected to use the curriculum trackers to ensure that curriculum coverage takes place in the classes they teach. The study also focused on HOD's, who are curriculum managers, expected to track and manage curriculum coverage together with teachers.

The KwaZulu-Natal department of education (KZN DOE) has introduced a number of intervention programmes aimed at the teaching and learning of mathematics and science at grade 12 (such as the Dinaledi schools in 2001), addressing the teaching of mathematics (such as the maths connect project in 1991 and improving teachers' pedagogical knowledge (such as the 1+9 programme in 2015). While it would have been interesting to evaluate the impact of the programme in achieving its aims, this study focused on contributing to the research sphere regards the extent to which Mathematics and Physical Science teachers made use of curriculum

tools at their disposal to either cover the curriculum or develop themselves professionally. As a novice mathematics teacher faced with challenges of curriculum coverage and newly introduced to the curriculum tracker, it was imperative to understand how teachers, both experienced and novice, used this tool for its intended purpose. These findings would not only be beneficial to my professional growth as a teacher but it speaks volumes about the success and failure of interventions meant to improve teaching and learning processes.

The Curriculum tracker is one of these tools and it covers both aspects of curriculum coverage and professional development. Teachers' uptake of the tool is expected to contribute immensely academically since the aim is to help teachers unpack the curriculum and understand the depth needed to teach its topics and for HODs to manage the curriculum. Moreover, teachers' uptake of the tool aimed to help teachers understand the importance of using different resource materials to provide learners with sufficient knowledge and skills needed for a particular topic. Stols (2013) found a shortfall within his study with respect to teacher covering the curriculum. This study, therefore, aimed at exploring teachers' uptake of the CT, with the hope to improve academic performance in mathematics and the sciences.

1.6.2 Professionally motivation

When I started working as a mathematics teacher in Pinetown district, anecdotal evidence showed that teachers struggled with completing the curriculum. This led to learners failing to pass common standardized examinations and sometimes led to teachers teaching beyond school time in trying to cover the curriculum. However, although it has been over three years since the introduction of the curriculum tracker and plan in Pinetown district, teachers are still complaining about failing to cover curriculum and most schools especially in grade 12 have opted to even teach on Sunday in order to cover mathematics and science curriculum. I, therefore, realise the need to understand the extent of teachers' uptake of the curriculum tracker since its main aim is to help with curriculum coverage.

As mentioned earlier, the department of basic education has implemented a number of interventions aiming to improve learner performance. However, most of these initiatives are mostly aimed towards improving methodologies to teach, e.g. 1+9 programme, Master science,

Dinaledi School project, Wits Maths Connect project to point out a few, not on curriculum coverage as it is the ultimate goal of PILO. Literature (e.g. Reeves and Muller (2005); Taylor, 2011; Stols, 2013; Bansilal and Rosenberg (2016) and anecdotal evidence have revealed the need for interventions targeting curriculum coverage, and this led to the introduction of the curriculum tracker. The knowledge of unpacking curriculum is a necessity for professional growth; therefore, this study aims at understanding teachers' uptake of this initiative that is supposed to contribute to their professional growth as mathematics and science teachers.

1.6.3 Personal experience

As it has already been highlighted that the researcher was a novice mathematics teacher with less than five years teaching experience at the time of the study, understanding teachers' uptake of the initiatives that were meant to enhance teaching and learning and improve learner performance was deemed necessary in order learn from their views and perspectives. Although researcher was a novice mathematics teacher, the researcher observed that the challenges associated with curriculum coverage in mathematics and science were still in existence, however, and that teachers still struggled with unpacking the curriculum. However, the researcher has not come to understand how the introduction of the curriculum tracker since 2015 has assisted to alleviate those challenges, and if not, what has been the contributing factors. It is, therefore, imperative to undertake this study in order to understand enabling factors and challenges associated with the curriculum tracker in the two districts that have been involved in the project for more than 3 years.

1.7 Objectives of this study

This research study aims to explore the usage of the curriculum tracker by secondary schools Mathematics and Science teachers in Pinetown and King Cetshwayo districts. In this study, the researcher aimed at addressing the following objectives:

- To determine the extent to which Mathematics and Science teachers are using the curriculum tracker to track curriculum coverage.

This was to be achieved by exploring the enabling factors and challenges teachers experience with the implementation of the curriculum tracker

- To explore the relationship between CT usage and curriculum coverage.

This was to be achieved by looking at teachers' usage of the CT, learners' book and learner performance since the introduction of CT.

1.8 Research questions

In line with the objectives and the aim of this study, which focused on understanding Mathematics and Science teachers' usage of the curriculum tracker in two districts, i.e. Pinetown and King Cetshwayo, this study was underpinned by the following research questions.

To what extent have Mathematics and Natural Science teachers and HODs used the curriculum tracker and other curriculum tools to track and manage curriculum coverage? To unpack this question, the researcher asks the following sub questions;

- Why have teachers used or not used the curriculum tracker to track curriculum coverage?
- How have the HODs used the curriculum tools to engage in professional conversations with teachers?
- What is the relationship between teachers' use of CT and curriculum coverage?

1.9 Location of the study

This study took place in two districts, namely Pinetown and King Cetshwayo. These districts were selected by the Department of Education and PILO to pilot the intervention programme from 2015 to 2017. While the programme was extended to other districts in 2018, these two districts were the only ones that had been involved in the programme for more than three years and the teachers were, therefore, expected to have extensive experience in using the curriculum tracker. Collecting data in these two districts could share more insight on the teachers' and HODs' use of the curriculum tracker. Instead of providing descriptive analysis, as has been the case with PILO preliminary findings, the researcher decided to do an in-depth study of six schools, three in each district. Although the findings will not be generalised, the study would share deep insight on the use of the curriculum tracker. Three schools in each district were selected using quintile distribution as the department of education categorisation of schools. Although all schools from different quintiles were provided with a curriculum tracker, schools from different quintiles responded differently to learning issues; therefore, the researcher decided to explore teachers and HODs from schools in different quintiles to understand their uptake of the curriculum tracker. The three schools selected in each district would be identified through pseudonyms.

1.9.1 Rural schools

The term rural can refer to areas that consist of the many tribal lands controlled by traditional leaders. Nelson Mandela Foundation (2005) gives an account of rural school situation which is mostly characterised by inadequate resources, such as shortage or poor teaching and learning equipment, poor quality infrastructure, overcrowded classrooms, unqualified and under-qualified teachers and lack of basic necessities like electricity, decent sanitation and running water. Considering the context of the schools categorised as quintile one and two and the definition from Emerging Voices, this study considers a rural area to be a geographic area that is located outside towns and cities, typical of low population density but limited settlements. Also considering the definition of rural context given by the department of education as one that is sparsely populated and where agriculture is the major means of economic activity, in this study, the context of rurality is the one with shortage of teaching and learning resources and where there is poor infrastructure.

1.9.2 Township schools

Similar to rural schools, township schools are the institution of learning populated by black South African children, situated in the residential areas on the periphery of towns and cities. Unlike the rural context, the township context is considered to be residential areas with low-cost housing developments and close to the cities and towns (Mampane & Bouwer, 2011). Similar to rural schools, township schools are known for their poor education, which is characterized by, among other things, lack of resources. Unlike rural schools, township schools, because of their close proximity to cities and towns, are not mainly affected by having unqualified or underqualified teachers.

1.9.3 Suburb schools

A suburb is a human settlement with high population density and infrastructure of the built environment. The suburb is a mixed-use residential area, existing either as part of a city or urban area. It is usually characterized by its population of middle and upper class community in terms of economic background. These schools are mostly mixed when it comes to racial categorisation and schools there are categorised as quintile 4 or 5 in terms of the department of education categorisation because they have teaching and learning resources and are fee paying schools. In terms of learner performance, these schools generally perform better than schools in township and rural contexts. Tables 1 and 2 below show the schools selected from each district.

Table 1.1: Schools selected in Pinetown district

	Quintile	Number of learners	Location
ISIZ	3	1200	Township
KWABA	3	512	Rural
PHO	5	1500	Suburb

Table 1.2: Schools selected in King Cetshwayo district

	Quintile	Number of learners	Location
ZIPHO	2	952	Rural
EKU	2	1100	Township
TISA	4	1450	Suburb

1.10 Significance of the study

Since there have not been many interventions addressing curriculum coverage in South Africa as compared to teacher knowledge, there has been limited research exploring teachers' usage of the tools that aimed to assist them improve curriculum coverage. Therefore, in this study the researcher hoped to bridge that gap. While there are studies investigating the impact of the intervention, there is, however, dearth when it comes to studies focusing on the perspectives of those expected to implement the intervention, in this case teachers and HODs. This study is of significance because in most cases when intervention programmes are implemented no research or limited research is done to explore the extent to which the intended goals have been achieved. In cases where such research is done, the voice of the teachers who are mainly the implementers of these interventions is limited. While teachers are the major players in the implementation of learning interventions, in most cases their voices seem to be insignificant. The findings from this study would not only be of help to teachers but to the DOE and PILO to modify the tools where necessary as the programme is rolled out in other districts in KwaZulu-Natal and in other provinces in South Africa. The study may also contribute to the understanding of how the curriculum tracker works and reveal the enabling factors and challenges with the usage of the curriculum tracker. The researcher hopes that this study might afford teachers the opportunity to voice their experiences in using the curriculum tracker.

1.11 Overview of the study

This study consists of seven chapters and is organized as follows:

Chapter one: Introduction and background of the study

In chapter one, the importance of this study is discussed by providing the introduction and background, and the problem statement. The aim of *Jika Imfundo* is clearly stated. Conducting empirical research is not just a matter of asking questions; there has to be a rationale and that needs to be clearly explained. Therefore, after outlining the problem statement, the rationale and motivation for this study are provided. In research, the phenomena being studied should be made explicit in order for the reader to understand the significance of the study. Thus, following rationale, objectives, research questions and significance of this study are outlined.

Chapter two: Literature underpinning this study is discussed

Chapter two provides a review of literature related to teacher professional development (TPD) and learning and teaching interventions. It further looks at the importance of curriculum, and the effect of curriculum coverage in the teaching and learning of mathematics and sciences. The chapter also discusses curriculum reforms, importance of curriculum coverage, challenges associated with lack of curriculum coverage, and causes of lack of curriculum coverage. Furthermore, the chapter discusses literature related to the effects of lack of curriculum coverage in South Africa, importance of professional development for mathematics and science, intervention programmes focusing on teachers' professional development, intervention programmes aiming at improving teaching and learning of mathematics and science, intervention programmes addressing learner performance. Lastly, the chapter discusses the intervention programmes addressing teacher mathematical knowledge.

Chapter three: Theoretical framework underpinning this study

In this chapter, the researcher presents and discusses the theoretical framework used as the lens to develop the argument and analyse the data. This chapter elaborates on the concept of the whole teacher approach as the underlying framework, characteristic of the whole teacher approach, the whole teacher approach as multidimensional, the whole teacher approach integrated, effect of context of the whole teacher approach as developmental, the key principle of the whole teacher approach, the whole teacher approach and professional activities and studies using whole teacher approach to understand teacher professional development.

Chapter four: Research design

In this chapter, the researcher presents and discusses the research design and methodology of the study. Here, the research questions and research aims are discussed. The paradigms are discussed in-depth, as are the research design and sample. Issues of quality and trustworthiness are discussed here. The chapter also discusses the limitations and ethical considerations of the study.

Chapter five: Analysis of Secondary data

In chapter five the focus is on the presentation and discussion of secondary data from PILO. In line with preliminary findings, this chapter focuses on presenting the findings from PILO in order to give descriptive analysis of the extent of teacher usage of the curriculum planner and tracker. Chapter five presenting enabling factors associated with usage of curriculum tracker.

Chapter six: Analysis of primary data

To gain an in-depth understanding of teachers' and HODs' usage of the curriculum tools, interviews and document analysis were conducted with teachers and HODs from six schools. Chapter six presents findings under the theme challenges associated with curriculum coverage from primary data collected by means of interviews and document analysis. It extends the discussion on the main questions and addresses all the sub questions.

Chapter seven: Discussion, Conclusions and Recommendations

Chapter seven synthesizes the findings presented in chapter five and chapter six and provides a summary of the emerging themes by providing a synopsis of responses to research questions. In addition, it discusses the implication of the findings. It ends with providing a general summary and recommendations.

1.12 Conclusion

This chapter introduced the phenomena being studied through articulating the background and rationale of the study. It is in this chapter that the researcher explained the objectives as well as research questions underpinning the whole study. The chapter further provided a detailed description of the location of this study.

CHAPTER TWO:

REVIEW OF LITERATURE

2.1 INTRODUCTION

The review of the literature is concerned with the summary and analysis of documents relevant to the research problem. According to C Bertram and Christiansen (2014), a literature review is a discussion of the important research that has previously been done in the related research field. It is important to look at the vital role that is played by teachers in the intervention of the curriculum. This chapter reviews the existing literature looking at the following themes:

2.2 What is Curriculum?

South Africa is currently transforming the education system(Weber, 2008). This section discusses the meaning of curriculum from different perspectives and curriculum change in the context of South Africa. This study explores teachers' usage of provided tools to address the lack of curriculum coverage. To understand the extent to which teachers engage with curriculum tools it is critical to first understand the context in which the curriculum is conceptualized.

Curriculum refers to what a learner is required to encounter, study, practice, and master. It entails making decisions about what should be taught, how it should be taught and when it should be taught(DOE, 2012) . The curriculum is a document drafted by curriculum experts appointed by the government, and which should be followed in schools. Palincsar (1998) posits that curriculum is more than the content or subject matter that is taught in schools, but involves teaching methods, learning objectives, classroom organization, and assessment measures. Palincsar (1998) further argues that the curriculum plays a significant role in social and political spheres of society in inducting learners into the culture, practices and social relationships of their society. Concurring with Palincsar (1998), Adu and Ngibe (2014) posit that the curriculum is the offering of social value knowledge, skills and attitudes made available to learners through a variety of arrangements during the time they are at school. This means that a curriculum is a contextualized social process and its coverage is more expansive than classroom teaching; it encompasses broad goals, e.g. to orientate learners into society.

Since a curriculum is contextualized, it goes through phases of change to meet the needs of the learners. As stated by Sahlberg (2006), curriculum change is a learning process for teachers and their schools. Therefore, a good understanding of curriculum change and clear conception of the curriculum are necessary conditions for improved implementation of the new curriculum into practice (Jansen, 1998). For curriculum changes to be successful, there is need for successful curriculum development. Many curriculum reforms are based on how the curriculum has traditionally been organized. Curriculum reform requires changing the way teachers teach and the way learners learn. The main driving force behind curriculum change is to produce learners who are competent in the outside world in as far as knowledge is concerned (Wilson & Gilbert, 2005). Curriculum change aims at changing the ways learners learn and the way teachers teach; therefore, better and understandable implementation strategies are required for the curriculum to be more successful in schools (Sahlberg, 2006).

In post 1994 South Africa there has been a number of curriculum reforms; C2005, RNCS, NCS, and CAPS. The aim has been for schools to use a curriculum that does not only focus on the end product but also places emphasis on the process of knowledge production and equipping learners for life outside school. In order to observe the success in knowledge production, it requires that the taught curriculum is covered for each grade because learning is a continuous process. Lacking of curriculum in one grade affects learners' performance in the grade that follows, thus, negatively affecting the knowledge process. The continuous curriculum reforms in South Africa have been signaling the problem that the knowledge is not developed, and as such, the end product is not of standard quality. Figure 2.1 below depicts the curriculum reforms post 1994.

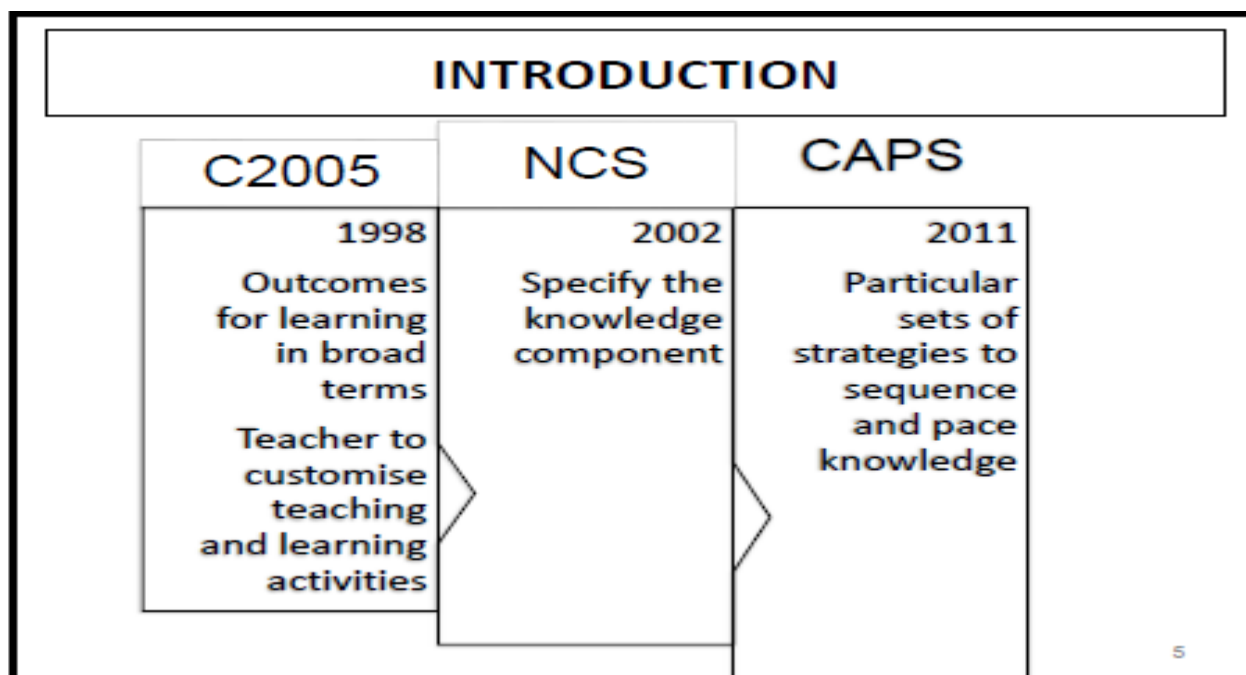


Figure 2.1: the figure above shows the different curriculum policies that have been implemented in the South African education system.

The emphasis in the CAPS is the sequencing of the topics to develop the knowledge among learners. However, if curriculum implementers, i.e. teachers and HODs, are not equipped with skills and knowledge, according to the sequence of the topics result on the negatively impact on curriculum coverage. Therefore, the introduction of the curriculum tracker was aimed at helping teachers and HODs with sequencing of topics and, in turn, improving curriculum coverage.

2.2.1 Importance of Curriculum coverage

The success of the curriculum is mainly measured by the success of the learners. Therefore, ensuring curriculum coverage does not only speak to teachers. It also speaks to policy makers and all the stakeholders involved in the teaching and learning process. Arora (2010) argues that curriculum coverage is important because it is central to learners' opportunities to learn. Also, Taylor (2011) believes that curriculum coverage is an important contributory improvement factor in South African schools that also provides learners with better opportunities to learn. Curriculum coverage is very important in the schools as it has been noted that the reason learners are not doing well in the results at the end of the years is that teachers do not cover the curriculum in schools.

2.3 Aims of the curriculum in the teaching and learning process

One of the aims of the curriculum is to reinforce commitment to social justice, human rights, and a healthy environment (DBE, 2010). It aims to develop citizens that are multi-skilled, knowledgeable, sensitive to environmental issues and able to respond to many challenges that face South Africa. One of the ways this can be achieved is through ensuring that everyone is accountable; for example, teachers are accountable for the performance of learners, learners are accountable for learning, and the school management team is accountable for managing the curriculum and so forth.

Education is one of the most important aspects of human resource development (Legotlo, Maaga, & Sebego, 2002). Every child should have the opportunity to achieve his or her academic potential. Teachers hold the key to the curriculum process (Chaudhary, 2015). Using a wide variety of techniques, teachers encourage learning by delivering content in creative and impactful ways. The curriculum serves the interests and purposes of children by determining the educational programme of activities being planned co-operatively by teachers and active learning, such as project work, which is characterized by participation on the part of the learner (Darling-Hammond, 2012). The curriculum is important to the schools because of its development of learners (Gay, 2013). The curriculum is important in education because it helps teachers deliver effective and quality education. Curriculum sets standards, goals and learning outcomes that enable teachers to judge whether or not learners are able to move onto the next level (O'Connor, 2017). An effective curriculum provides teachers, learners and the governing body with a measurable plan and structure for delivering quality education (Johnson et al., 2016).

2.4 Curriculum coverage

Curriculum coverage is vital not only in Science and Mathematics but in all subject areas in order for the effective learning process to take place. Without covering the curriculum, the aims of developing multi-faced skilled citizens, as pointed out by CAPS (2011), cannot be achieved. In South Africa, the curriculum document, namely CAPS, emphasizes a number of issues with respect to curriculum coverage. These are covered below.

Science is a systematic way of looking for explanations and connecting the ideas we have, and in science certain methods of inquiry and investigation are generally used (CAPS, 2011). Curriculum coverage is very important in education. Science curriculum aims to provide opportunities to make sense of ideas they have about nature. In science, to cover the curriculum learners should know three specific aims. Without covering the three specific aims outlined below, curriculum is not covered.

Specific Aim 1: Doing science

- Learners should be able to complete investigations, analyze problems and use practical processes and skills in evaluating solutions

Specific Aim 2: Knowing the subject content and making connections

- Learners should have a grasp of scientific-technological and environmental knowledge and be able to apply it to new contexts.

Specific Aim 3: understanding the uses of sciences

- Learners should understand the use of natural science and indigenous knowledge in society and in the environment.

Mathematics is a language that makes use of symbols and notations for describing the numerical geometrical and graphical relationship (CAPS, 2011). Mathematics is also a human activity that involves observing, representing and investigating patterns and qualitative relationships in physical and social phenomena and between mathematical objects themselves.

The CAPS document and the Department of Basic Education emphasize the importance of curriculum coverage in order to improve learner performance (CAPS, 2010). According to (Plewis, 2010), curriculum coverage is an important variable for explaining the learners' academic progress. He confirmed that the more Mathematics and science curriculum is covered by the teachers the greater the progress made by the learners. Leepo (2015) emphasizes that the curriculum coverage was explained as a plan developed for the teachers for usage in the

classroom, indicating what must be taught as prescribed in the policy document and in the assessment guidelines.

As noted above, the most important person in the curriculum implementation process is the teacher. With their knowledge, experiences and competencies, teachers are central to any curriculum development effort (Alsubaie, 2016). Thus, it can be asserted that teachers are the ones who implement the curriculum in their own classrooms; therefore, it is imperative they are acquainted with the curriculum. As rightfully pointed out by Graven (2002), a teacher's role is to prepare learners to adapt the curriculum. If teachers are expected to prepare learners, they need to be fully acquainted with the curriculum, get acquainted with unpacking, managing and tracking the curriculum. The best way to achieve this goal is to provide teachers with orientation and training (Department of Education, 2011). Covering the curriculum or not covering the curriculum can have effect on the aims of the CAPS document and literature, it is clear that covering the curriculum is important not only to ensure that learners pass but for ensuring that the specified outcomes are achieved. In that way, learners' progress is not only based on progressing from grade to grade, but is based on the fact that the specified outcomes have been achieved. Thus, it ensured that they have acquired the necessary knowledge and skills to compete in the global world.

Over the years, South Africa has been plagued with the crisis of poor performance in Science and Mathematics. There has been an outcry of the shortage of knowledgeable and skilled learners to pursue careers considered to be scarce skills, such as engineering, mathematicians, actuary Sciences and so forth. There has been an outcry that the schooling system is producing learners who are not equipped to compete in the global world as the TIMMS reports constantly show that South African learners perform far below the expected level in mathematics and Science tests as compared to other learners from other developing countries. Furthermore, the South African schooling system produces learners who failed to cope with university demand, especially in the field of Mathematics and Sciences (Modisaotsile, 2012; Spaul, 2013). Although most literature does not directly reveal the reasons behind all these challenges, in most cases it appeared that learners' content knowledge is lacking (TIMMS, 2015), thus suggesting that the intended outcomes were not achieved.

In a thrust to curb the crisis, the Department of Education evaluated the reasons for learners' poor performance in the Annual National Assessment (ANA) in 2014. One of the main causes that were articulated in the Department of Basic Education diagnostic report (2014) was lack of curriculum coverage. Even before that, although not formally evaluated, the initiatives by the Department of Education and other NGOs such as ZENEX, ESKOM for winter schools and Saturday classes suggested that there is a huge concern with the impact of the lack of curriculum coverage towards learner performance in Science and mathematics. However, most of the previous interventions only targeted covering the matric curriculum. The 2014 findings suggest that addressing curriculum coverage should start in grade 8. These suggestions and findings led to the introduction of the curriculum tracker across all grades from grade 8 to grade 12 for both mathematics and Science. The main aim, as explained in chapter one, is to assist teachers plan, manage and track curriculum coverage and for HODs to have a professional conversation with teachers as to how to manage and track curriculum coverage with the aim to cover the intended outcomes for the specific grade. It is for this reason that in this study, the aim was to explore the extent Science and Mathematics teachers have managed to use the curriculum tracker to plan, manage and track curriculum coverage. To a limited degree, the study also included HODs because they are expected to work with teachers to ensure curriculum coverage and they also teach these subjects. As shown on the figure below, principals are curriculum managers.

2.5 Implementation of curriculum

According to Nnabule, Aneke & Otegbulu (2016) said that Classroom is the center of curriculum implementation and the teacher is at the middle of contents leading to the achievement of curriculum objectives and the learner. Also define Curriculum implementation stated that it is the process of interpreting contents of the curriculum by the teacher. In the study conducted by Nevenglosky (2018) which consist of 10 participants (8 teachers and 2 administrators) pointed out that curriculum implementation is how teachers deliver instruction and assessment through the use of specified resources provided in a curriculum. It is important to understanding the beliefs and concerns of teachers can provide insights into whether curriculum implementation will meet with success or failure because teacher they play vital role in the implementation of the curriculum. curriculum implementation includes the provision of organized assistance of staff in order to ensure that the newly development curriculum and

the most powerful instructional strategies are actually delivered at the classroom level. McNeill, Katsh-singer, Gonzalez & Loper (2016) found that teachers' beliefs significantly influence their decisions for instruction. If beliefs play such a vital role, then taking time to learn about teachers' concerns, values, and perceptions should improve the implementation process by proactively addressing these areas (Al-Shabatat, 2014; Rakes & Dunn, 2015).

2.6 Challenges associated with lack of curriculum coverage

According to Mupa and Chinooneka (2015), teachers are struggling to finish the curriculum and to employ a variety of teaching methods. Among other reasons articulated is the shortage of resources and time. The same concerns were raised by Razafimbelo, Rajonhson, Ratompomalala, and de la Croix Malazamanana (2009) who allude to the issue of time as a factor contributing to lack of curriculum coverage. Author argue that there is not enough time to complete the curriculum, especially in mathematics because the syllabus is too long and difficult, and the materials needed for teaching and learning of mathematics are scarce. Mtsi and Maphosa (2016) raises the same sentiment of the shortage of time but attributes it to the fact the CAPS document is too packed, and as a result teachers need to be equipped with skills and knowledge to unpack the curriculum. Shava and Heystek (2019) also mention that there are a lot of factors contributing to lack of curriculum coverage in secondary schools, and these include poor quality teaching, poor classroom instruction, inadequate teacher knowledge and skills, teachers assigned to subjects for which they are not trained, low teacher morale, ineffective leadership and inadequate resources. Challenges associated with lack of curriculum coverage are motivation of learners, the learners' attitude to learning, the learner cognitive abilities, the teaching and resources availability and the climate at the school (Schulze & Steyn, 2007).

In the unpacking of the curriculum four elements need to be considered because these plays a good role in ensuring that the curriculum is implemented effectively, i.e. teaching; learning, assessment, and resources used for teaching and learning. These are outlined in the figure below.

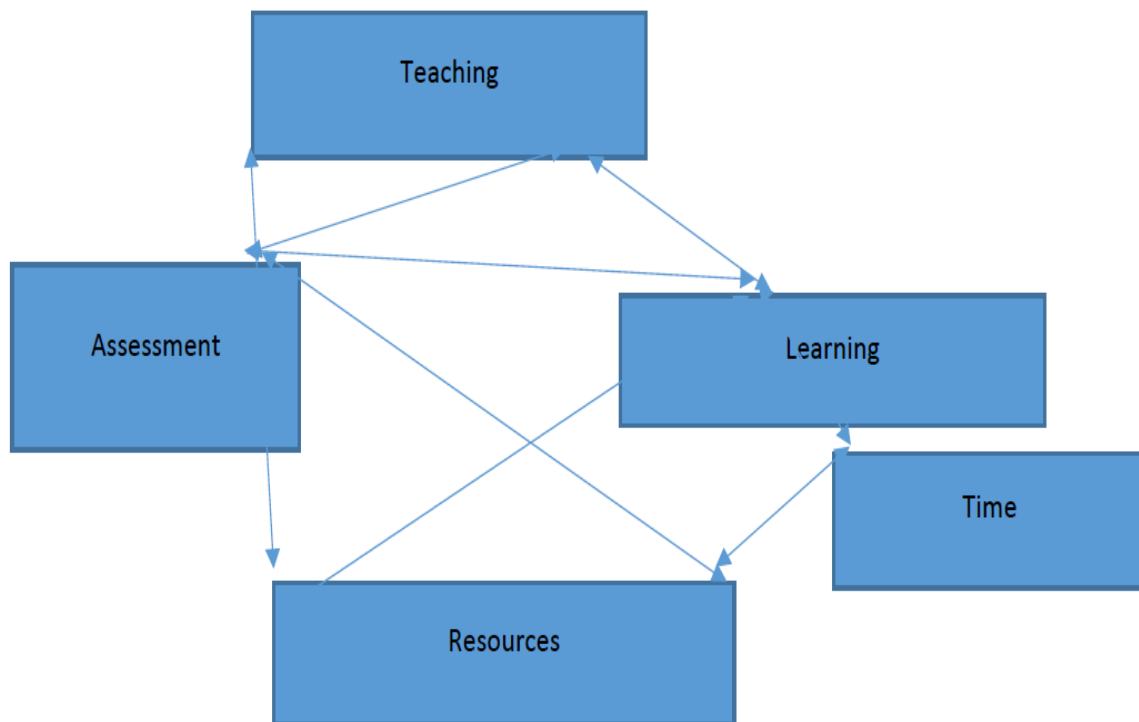


Figure 2.2: core curriculum elements

As shown in the figure above, the four elements are intertwined. For example, without resources no effective teaching and learning can take place. Further, without resources more time will be spent in trying to explain simple concepts that learners could have read and understood by themselves, thus negatively impacting assessment because limited tasks can be given to learners.

In order to ensure the success of curriculum coverage, curriculum management requires a provincial strategy that is aligned to resources, such as human physical assets and linked to the internal and external environment so that all the participants move strategically towards the achievement of effective curriculum implementation. Elements such as supervising the taught curriculum at the classroom level, monitoring and evaluating the curriculum implementation, providing support services and resources to teachers, providing skills development training through in-service education and training for teachers, development exemplars and demonstration programmes of quality learning activities and quality assessment for learning.

The key driver to curriculum success is the development of teachers' knowledge, skills, attitudes and the alignment of teacher training methods. It is, therefore, within these parameters that this study aims to explore teachers' uptake of the tools that are aimed at developing their

knowledge about unpacking the curriculum and HODs' knowledge of managing the curriculum.

2.7 Causes of lack of curriculum coverage

Research shows that there are lot of factors contributing to lack of curriculum coverage in secondary schools. Poor quality teaching, poor classroom instruction, inadequate teacher knowledge and skills, and teachers being assigned to subjects for which they are not trained, low teacher morale, ineffective leadership and inadequate resources are some of the factors (Shava & Heystek, 2019). Research also shows that curriculum coverage is also affected by factors such as motivation of learner, the learners' attitude to learning, the learners cognitive abilities, the teaching and resources availability, and the climate at the school (Schulze & Steyn, 2007). Mji and Makgato (2006) report that outdated teaching practice and lack of basic content knowledge can result in the lack of curriculum coverage. They further state that the poor curriculum coverage has also been exacerbated by a large number of under-qualified or unqualified teachers who teach in overcrowded and non-equipped classrooms. One of the reasons that result in the lack of curriculum coverage, which will be discussed below, is the lack of monitoring of schools by the district officers, lack of control over the curriculum and lack of expertise to manage the curriculum and the additional workload and shortage of resources in the schools.

2.7.1 Lack of monitoring of schools

All the provinces in South Africa have schools situated in rural areas with their unique conditions and challenges, where teachers work under bad conditions and without much human support (Gardiner, 2008). A challenge, particularly in rural high schools, is teachers' lack of subject content knowledge, and limited resources contributing to teachers' low morale (Gordon, 2009). The inability of the subject advisors to supervise teachers' performance add to the doubtful ability of most Professional Development programme to change teachers' practices (De Kadt, 2010). Adedeji and Olaniyan (2011) report that schools in rural areas are not necessarily monitored regularly by the district officials due to their remote location. Lack of monitoring of the schools results in the schools doing what they like and the teachers not reporting on time or being absent from school for no good, all which lead to poor performance by learners of mathematics and science. Mampane (2013) highlights that in under resourced schools, particularly township schools, there is no one to take care of learners in the absence

of their teachers, which results in learners not finishing the curriculum. Teachers absent themselves from school without valid reasons and, worse, they do not inform the principal beforehand (Brown & Arnell, 2012). Wastage and inefficient use of time will result in less teaching time and will make it impossible for teachers and learners to cover the curriculum (Stols, 2013).

Reports from district intervention teams and the oversight visit by the MEC for education in KwaZulu-Natal indicate that there is no common strategy for the monitoring of curriculum delivery across the twelve districts (DBE, 2011). There is no instrument designed to inform the system if the learners achieve learning objectives (DBE, 2014). The Department of Education aims to improve curriculum delivery, management, and support.

2.7.2 Lack of control over the curriculum and expertise to manage curriculum

Literature indicates that teachers are concerned about the overcrowded curriculum (Nel & Luneta, 2017) and teachers have no control over curriculum selection, development, and implementation. If teachers' input on curriculum issues is eroded, this will significantly undermine their professional standing. Teachers stress their willingness to be accountable but believe it is important that the profession be involved in the accountability mechanisms and processes (Selepe, 2016). In current interventions such as 9+1 intervention, teachers are provided with lesson plans and the annual teaching plan. However, no mechanism is put in place to ensure that the lesson plan is delivered accordingly and that HODs are actually managing the curriculum. While it is good to provide teachers with lesson plans, it takes away the ownership of the curriculum as the expectation to be told what to do infiltrates their minds. Other than tracking and managing the curriculum, the introduction of CT aims to place teachers and HODs at the ownership level of the curriculum. Similar views were raised by (Graven, 2016b) that when teachers are motivated, they are more likely to unearth their expertise. The study by Börü (2018) states that motivation, on the other hand, stimulates teachers to change their behaviors and make effort to sustain their endeavors in the direction of determined goals.

2.7.3 Additional workload and shortage of resources

In South Africa, the ratio of teacher to learner is 1: 35. However, the reality is that mostly in rural areas the ratio of learners to teachers is probably double. Therefore, teachers and HODs find themselves unable to work with learners to cover the curriculum. (Raselimo & Mahao, 2015), posit that the learner-teacher ratio may impact negatively on teachers' ability to successfully implement an integrated curriculum. They further assert that the shortage of classrooms is sometimes the cause of the overcrowding in the classrooms. Zheltoukhova, O'Dea, and Bevan (2012) describe additional workload on teachers as the task that will result in underperformance in their work and will exceed personal capabilities and result in threats and reactions of nervousness, anxiety, frustration, pressing or annoyance. Mahlangu (2001) contends that additional workload that is embedded within a curriculum reform cannot be disregarded. Jansen (2001) concurs, stating that teachers complained that the curriculum was too demanding, stressful and time-consuming. It is not surprising that Mahlangu (2001) asserts that due to increased workload during the implementation of curriculum reform, some teachers may be unwilling to go an extra mile in the work they do, which will have an impact on curriculum coverage. In their study, Ayeni and Amanekwe (2018) state that teachers' instructional workload is faced with serious challenges, which, among others, include shortage of teachers' lack of instructional materials, learners over-enrolment, high number of teaching periods per work, lack of well-equipped laboratories and large class size without instructional technology effect learners academics performance in secondary schools.

Secondly, in rural areas additional workload is not only caused by overcrowding in classrooms; it is further perpetuated by shortage of teachers(Matshipi, Mulaudzi, & Mashau, 2017). This results in one teacher teaching mathematics and sciences from grade 8 to grade 12, and with the emphasis that is often put on the matric pass rate, such teachers tend to ignore other classes and focus on matric. The same was echoed by Nel and Luneta (2017) who state that the reason teachers do not finish the syllabus in schools is that they are having too many classes. A study by Mbugua, Kibet, Muthaa, and Nkonke (2012) indicated that 27.8% of mathematics teachers in rural schools taught below 15 lessons per week, 66.7% teachers between 16 to 30 lessons in a week while 27.8% taught more than 30 lessons. This indicates that 27.8% of mathematics teachers are still overloaded. This may contribute to poor performance in mathematics. Teacher additional workload has a direct impact on learners' academic achievement. Insights and resilience, positive and caring relationships are requirements of effective teaching in the classroom (Sparks, 2016). This condition definitely results in negative influence on the

instructional quality in schools, which translate to poor attitude and values, and low academic performance (Ayeni & Amanekwe, 2018). Other factors that cause lack of curriculum coverage include shortage of resources, inadequate facilities such as classrooms, laboratories, libraries and playing grounds, all which can affect the implementation of the new curriculum (Jansen & Taylor, 2003).

2.8 Effects of lack of curriculum coverage

Teachers in the schools are provided with curriculum planning and delivery materials, are supported by subject advisor via school visits, and cluster visit. The curriculum materials provided include learning programmes, work schedules, lesson plans, and assessment. This was one of the interventions that was implemented to help teachers complete the curriculum and effective curriculum delivery system, which will be institutionalized in classrooms, and further assist teachers to improve their classroom practice. The process of engaging with the demands of the curriculum and the textbook or workbook and transforming these demands into instructional units is necessary for good teaching (Long & Dunne, 2014). The teacher may have covered the curriculum in the classroom but the important question is whether the learners have engaged with the topic taught in class to build the foundation for more advanced mathematics. Mathematics teachers in South Africa have been facing many challenges, and teachers in the lower secondary school have been implementing a new reform-oriented curriculum. Researchers claim teachers need considerable support if they are to meet the demands of the current reforms in mathematics education (Gunnarsdóttir, 2014). One of the biggest effects of lack of curriculum coverage articulated by literature (Stols, 2013; Pournara, Sanders, Adler, and Hodgen (2016) and media is learner poor performance.

Various reports had revealed that, generally 60% of the curriculum, especially in mathematics and +/- 75 % in Sciences is covered, meaning year in, year out some of the outcomes are left out, thus, impacting on the learner performance. The Gauteng department of basic education (GDE) and KwaZulu-Natal department of basic education (KDE) define poor performance subjects as those that obtained below 60% pass rate. Therefore, mathematics and science have consistent poor performance in the national results and it has been observed that the reason for poor performance is that teachers do not complete the curriculum in schools. In their study conducted by Makgato and Mji (2006), in seven schools with poor pass rates in district 3 of

Tshwane North, with grade 11 learners and educators, raised alarming concerns about the lack of curriculum coverage in mathematics and science. The findings of their study showed that some topics are not covered in certain grades, which results in poor performance of learners in subsequent grades. For example, learners find such topics as geometry and trigonometry difficult, and in science, topics such as organic molecules and Doppler effects are also often found challenging. Teachers focus more on easy topics that learners know and ignore the topics that learners are struggling with. A number of factors that contribute to teachers not teaching these topics include poor content knowledge by teachers and also learners' attitudes towards the topics. According to Tranter and Percival (2006), poor performance is experienced whenever teachers work to a standard that is below their capability. To improve learners' attainment levels is to enhance the way the curriculum is delivered in mathematics and science and also to create a positive environment for learning.

Although there are other reasons associated with poor performance of learners, lack of curriculum coverage is a cause for concern (Stols, 2013; Taylor, 2011; Reeves and Muller (2005). Adding to lack of curriculum coverage, Stols' (2013) study showed that the number of activities done by learners were insufficient, implying that although teaching might have taken place there is no evidence that learners were assessed on the tasks. This impacts negatively on the achievement of learning outcomes. A study by Bansilal (2017) showed the schools' highest ANA average offered its learners more activities to practise as compared to the schools with low average. This suggests that the poor performance in the schools with low average has much to do with lack of curriculum coverage. There are a number of factors affecting the formative summative assessments in science. Factors include learners' attitudes towards science teachers, socio-economic status of learners (Farooq, Chaudhry, Shafiq, & Berhanu, 2011; Ghazali, 2016), poor teaching methods, lack of instructional materials, lack of functional laboratories, poor learner-teacher morale (AMIR, Mohamed, & Mnjokava, 2016) and lack of qualified teachers.

2.9 Factors that influence curriculum implementation

Curriculum reforms are necessary to meet the demands of the country. However, for successful curriculum reform, proper implementation and ensuring that curriculum implementers are well equipped to adapt to curriculum reforms are required. Curriculum change in most countries is influenced by political and economic factors (Selepe, 2016). In post 1994 South Africa, there

have been a number of curriculum reforms with the aim of ensuring that the country can compete with developed countries. However, in the thrust to reform curriculum in most cases curriculum implementers This leaves them overwhelmed and feeling helpless. When support is provided, it is more of a monitoring form than a supportive form. In that way, teachers and HODs feel the need to do the job for compliance purposes rather than for effective purposes. In the study by Mkhwanazi, Ndlovu, Ngema and Bansilal (2017), it was observed that teachers work in a compliance mode. The same sentiment was evident in the study by (Carol Bertram, Mthiyane, & Mukeredzi, 2013). Policy makers are responsible for curriculum development. However, teachers and HODs are responsible for curriculum implementation, and as such their beliefs and attitudes play a crucial role.

2.9.1 Teacher beliefs

Literature emphasizes the importance of curriculum coverage and exposing learners to a variety of activities in achieving learning outcomes (Mkhwanazi, Ndlovu, Ngema, & Bansilal, 2017). The literature further points out that developing a supportive school environment where everyone is accountable is a crucial factor in curriculum coverage (Bhengu & Mkhize, 2013). The implementation of a new curriculum is not easy. The challenges are more burdening for the teachers as they are the ones who are expected to enact the curriculum (Selepe, 2016). Regardless those challenges, if teachers believe in the curriculum, they tend to find ways to make it work. As Bybee, McCrae, and Laurie (2009) posit, teachers' beliefs, practices and attitudes are important for understanding and improving educational processes. Furthermore, Akinsola (2008) states that teachers' beliefs are very important because they directly affect the implementation of the curriculum. Without doubt, the important person in the curriculum implementation process is the teacher. With their knowledge, experience and beliefs, teachers are central to any curriculum development effort. According to Bryan (2012), teachers' beliefs on curriculum implementation may be different, and these include beliefs about how learners learn, a teacher's role in the classroom, the ability levels of learners in a particular age group and relative importance of content topics.

2.9.2 Teacher professional development (TPD)

Teacher professional development is defined as teachers learning how teachers learn and how they apply their knowledge in practice to support pupils' learning (Postholm, 2012). Teacher professional learning is defined as processes that result in specific changes in the professional

knowledge, skills, attitudes, beliefs or actions of teachers (Mitchell, 2013). Moreover, Professional development is the strategy that schools and districts use to ensure that educators continue to strengthen their practice throughout their career (Mizell, 2010). Drawing from the above statements, one can argue that TPD is an ongoing process, not only aimed at addressing the crisis but at ensuring teachers continually grow with respect to their teaching expertise. Botha and Herselman (2018) argued that teacher Professional Development (TPD) is not only changing classroom practice but also empowering teachers to become lifelong learners. Professional development is important to teachers because it helps them with contemporary teaching information techniques and methods of teaching. Although experience plays a crucial role, continual growth is needed to adapt to current trends in education. The introduction of new interventions to improve education aims at professional development of teachers targeting different aspects. The introduction of CT aimed developing teachers and HODs' expertise with tracking and managing the curriculum. In the next sections, the researcher discusses what literature says about teacher professional development.

Based on the above literature, one can argue that professional development contributes to teachers' development in decisions making. There are various forms in which professional development is made available to teachers. For example, workshops that occur as part of teachers work in the school (Woodcock & Hardy, 2017). King (2016) emphasises that teacher professional development is widely accepted as a mediating factor for enhancing learners' outcomes. Echoing the same but using a different perspective, Dinham (2007) and Bubb and Earley (2008) state that professional development is not defined by activities, courses or experiences but as outcomes from these courses, activities or reflections on day by day experience in the classroom.

In the context of South Africa, many professional development initiatives that have been implemented in one way or the other encompassed what the above authors have articulated. However, many TPD programs that have been implemented focus on one dimension of teachers' work, that is to teach with limited attention given to developing teachers to manage the curriculum. In cases when these kinds of workshops are done, it is mainly at a point of change of curriculum and are not ongoing and this forfeits the idea of TPD as professional growth to being a crisis management tool. This form of professional development does not align with the one articulated by Antoniou, Kyriakides, and Creemers (2015), who ascertain

that teacher Professional Development are mechanisms for developing teaching practices in order to enable teachers to teach to a high standard (Antoniou et al., 2015). If TPD is used only to introduce teachers to new a curriculum on a once off basis or to manage the crisis, teachers tend to not see its impact on their professional growth. Bryce, Wilmes, and Bellino (2016) posit that using TPD to manage crisis addresses teacher practices from limited cognitive perspectives, leaving unexplored the shifts in identity that may accompany teachers along with their journey in becoming skilled in inquiry-oriented instruction. The aim of this study was not to explore the implementation of TPD, but to explore teachers' and HODs' uptake of innovations towards their professional development. However, unpacking the literature on what constitutes a teacher professional development was necessary in order to understand the reasons teachers' uptake/not of the curriculum planner and tracker.

2.10 Teacher Professional development in South Africa

Professional Development in South Africa has been an issue of much debate in the past years (Reddy, 2006; Wright, 2009). Literature shows that the small percentage of teacher professional development initiatives in South Africa pays more attention to pedagogy and instruction (Reddy, 2006). There are various reasons for that, but one is that learner poor performance in mathematics and science has been associated with lack of content knowledge and pedagogical content knowledge. The introduction of the Integrated Quality Management System (IQMS) in 2003 was meant to allow teachers and HODs to work together to identify areas of difficulty that affected the teaching and learning process. The IQMS states the following aims:

- To identify specific needs of educators, schools and district offices for support and development.
- To provide support for continued growth.
- To promote accountability.
- To monitor an institution's overall effectiveness.
- To evaluate an educators' performance.

Furthermore, one of the seven roles of a teacher being a lifelong learner, meaning that teachers need to continually upgrade their knowledge. Although teachers enroll at institutions of higher learning for postgraduate studies, these programmes are not directly preparing them for day to day teaching duties, e.g. unpacking the curriculum. Therefore, the needs for teachers identified

through IQMS cannot all be met by means of enrolling for higher degrees; there is need for ongoing professional development in school settings, attending to the current needs of teachers. The introduction of *Jika Imfundo* aimed at bridging that gap through providing training and tools to the School Management team to initiate professional conversation with teachers. In addition, teachers are provided with tools to use to unpack the curriculum, and reflect on their lesson. All these tools aimed at providing personal growth to teachers or SMT with respect to unpacking and tracking curriculum coverage.

2.11 Importance of professional development for Mathematics and Science teachers

In recent years, there has been growing dissatisfaction with outdated approaches to teacher education. In light of the poor mathematics and science results, it is of importance that teachers be developed in terms of the mathematics and science knowledge they teach and the pedagogical component of it (Nel & Luneta, 2017). Literature indicated that teacher education programs are not adequately preparing teachers for future conditions and needs of learners (Johnson, Kraft, & Papay, 2012).

Mathematics and science teacher professional development is very important so that they can develop. According to Barbour (2016), teachers who teach mathematics should have the opportunity throughout their career to develop their knowledge about mathematics and knowledge about how to teach mathematics. For science teachers, the specific character of science is an essential ingredient of teacher practice, of teacher learning and, thus, of programs designed to facilitate these outcomes (Luft & Hewson, 2014). Wei, Darling-Hammond, Andree, Richardson, and Orphanos (2009), argue that Professional Development purposefully constructed learning opportunity for mathematics and science teachers that follow initial teacher preparation programs. These programs focus on content, context support and guide teachers' learning.

Teacher professional development for mathematics and science teachers is a complex process that includes the cognitive and emotional involvement of teachers, both individually and collaboratively (Kellner & Attorps, 2015). Avalos (2011) concurs with Kellner and Attorps (2015) that teachers typically have limited opportunities to collaborate with others who can offer them support in their instructional practices. Teachers need to improve their experience,

but they often seek out the opportunities to develop themselves. Mathematics has been at the forefront of both educational reform efforts and calls for Professional Development opportunities, particularly among growing evidence that continuing support and structured learning opportunities for teachers can lead to significant improvements in learners' mathematics and science achievement (Borko, Koellner, Jacobs, & Seago, 2011). The idea of the natural-born teacher has been displaced by research that points to the positive correlation between effective professional development and improved teacher practice, which has in turn been linked to improved student performance (Reimers, Farmer, & Klein-Gardner, 2015). Effective professional development for teachers is predicated on the belief that effective teaching is not an innate ability, but a skill that can be acquired. Krainer (2014) points out the importance of teachers' attendance and participation in development and training programs.

2.12 Intervention programmes focusing on teachers' professional development.

South Africa is faced with a challenge of redressing inequalities of the past, where a significant number of teachers were trained in underdeveloped teacher training colleges of education created by the apartheid government (Gordon, 2009). Education has been an actual topic in teacher education for decades, and providing quality education to diverse learners remains a challenge, particularly in the fields of mathematics and science (Ritosa, 2017). Although the poor performance of learners in mathematics and science has been high in South Africa, there are interventions aiming to curb the crisis. These programmes, such as the 1+9 program, *Dinaledi*, *Vuma*, which is *Vula* Mathematics Academy, Department Content Delivery workshop, NBT Coaching and Advanced programme mathematics (AP Maths) have been and are currently aiming at developing teachers' expertise in various categories, e.g. methodologies to teach. These programmes are offered as workshops for teachers. Teachers are expected to attend these programmes but are not implementers of the programme. Unlike these programmes the implementation of the curriculum planner and tracker rests upon teachers and HODs. It is within these parameters that the researcher's aim was to explore teachers' uptake of the curriculum planner and tracker as they are the immediate implementers of the tools.

2.13 Intervention programmes aiming at improving teaching and learning of mathematics and Science.

The concern with learner poor performance in Mathematics and Science has been at the forefront of government debates. In order to curb the crisis, various intervention programmes have been implemented, others focusing on providing mentoring support to learners with respect to answering exam questions. As Katamei & Omwono. (2015) point out, all programs meant to provide learners with extra support need to be planned in such a way that they fit into the normal working patterns of a school. These programmes, in the form of extra classes, are conducted by teachers in the school setting, and only on rare occasions are learners taken out of the school setting. In that way, while learners are being mentored on strategies to respond to examination questions, they are not confronted with burdens of adjusting to new settings. Other intervention programmes focus on curriculum coverage. However, these mainly target matric learners. With respect to interventions targeting curriculum coverage, the main focus has been on matric because for a long time in South Africa, emphasis on learner performance has been centralized around matric results. It is only recently that new interventions such as 1+9 programmes and Dinaledi have taken into account what Pournara (2015) refers to as the breadth of the South African school mathematics curriculum. Other authors have also emphasized that intervention programmes need to take into account the breadth of the countries' school curriculum (Adedeji & Olaniyan, 2011).

Influenced by research, the vast majority of intervention programmes have been targeting teachers' knowledge since research has identified a relationship between teacher knowledge and learner performance (Bansilal, Mkhwanazi, & Brijlall, 2014; Hirvonen & Hoddinott, 2017; Mji & Makgato, 2006). According to Hirvonen and Hoddinott (2017), intervention programmes play a crucial role in improving practitioners' expertise. These intervention programmes are either an initiative from the Department of Education or NGOs. Some of these projects, such as the Dinaledi and Trends in International Mathematics and Science Study (TIMSS), are introduced worldwide and some, such as Leap Science & Math's are introduced in particular provinces. Some of the projects target certain subjects; for example, Wits Math's connect project aims to improve learning gains in Mathematics across all Secondary levels in Gauteng through strengthening teacher knowledge in mathematics. Just In Time teaching in science is one of the interventions that was implemented in the 1990s for science teachers. However, its use has since spread to many other subjects. The introduction of flipped classroom teaching approach aimed at helping learners for better learning.

JET Education Services has played a supportive role to the government in its quest to improve education. In the past 18 years, JET has been directly involved in over 13 school improvement projects that took the form of comprehensive school or systemic improvement projects, or component-specific projects such as teacher development projects. The comprehensive school improvement project includes support of school functions such as teaching and learning, management and resourcing. It hopes that through these interventions a new, efficient and effective curriculum delivery system will be institutionalized in classrooms assist teachers to improve their classroom practice. In this project, mathematics and science teachers were provided curriculum planning and delivery materials and were supported via school visits at cluster level. Similar to curriculum planner and tracker, the curriculum materials provided included learning programmers, work schedules, lesson plans, and assessment tasks.

The common trend among these intervention programmes is the concern with improving learner performance in Mathematics and Sciences. However, unlike the previously implemented intervention programmes, which paid particular focus to particular grades, *Jika Imfundo* was introduced across all phases for English, Mathematics and Sciences as these have been identified not only as the subjects where learners were performing poorly but also as key subjects in the development of the economy of the country. Unlike the other intervention programmes, *Jika Imfundo* is concerned with curriculum coverage across grades. Its immediate goal is to help teachers and HODs with the expertise to track and manage curriculum coverage, and its long term goal is that if curriculum coverage is achieved, the intended learning outcomes of each subject would be achieved, thus, improving learner performance. Since the intervention is ongoing, this study was not directly researching the success or failures of *Jika Imfundo*; rather it aimed at exploring the extent to which the immediate goals had been achieved in the two districts where the intervention had been piloted starting 2015. In addition, this study did not aim to provide quantitative analysis of what has not been achieved, but sought to explore from the implementers' perspectives the extent they have used the provided tools for the purpose it is intended and what they find to be working or not working in their contexts.

2.14 Intervention programmes addressing learner performance

The Department of Education has been implementing different intervention programmes, which aims at addressing learners' performance in the school. The poor performance of learners in mathematics has been high on the South African agenda for some time now (Kriek

& Grayson, 2009). No significant improvement has been noted in learners' mathematical knowledge output. Intervention has become an important tool for servicing learners who struggle academically, particularly in Mathematics and science (Meador, 2015). There has been quite a number of interventions, such as Student Assistance Program (STAR). The purpose of the STAR programme was to help learners who are experiencing behavior and academic difficulties, which pose a barrier to their success. It offered support not only to learners but to parents also. The Last Push is the programme that was implemented across all districts in improving learner performance. These programmes target assisting learners with barriers to learning either academically or behaviorally. However, the programme for improving learning outcomes in schools, which was implemented in 2015 in Pinetown and King Cetshwayo district, aimed beyond helping learners with learning barriers. It aimed at working with teachers to improve the curriculum coverage; thus, leading to achieving the learning outcomes. Intervention is important for further support to learners' development within a particular area of the curriculum, and to help learners to develop their social skills, self-confidence and self-esteem.

2.15 Intervention programmes addressing teacher mathematical knowledge

Pournara et al. (2015) posit the need to address teachers' mathematical knowledge because the lack of teacher mathematical knowledge for teacher impacts learner performance negatively. Bansilal et al. (2014) argue that the problem for poor mathematics content knowledge of mathematics teachers in South Africa remains the big issue due to the lack of intervention and professional development of teachers. However, in the past years there have been a number of interventions aiming at addressing mathematical knowledge for teaching. These interventions are directly linked to the classroom situation. For example, the 1+9 programme is one programme aimed at using experienced teachers to mentor others as well as the specific needs of the individual. As Nel & Luneta. (2017) state, "mentoring is an intervention that can be located in the classroom and be customized to be specific needs of the individual teacher". Mentoring is an intervention that supports teachers by having scheduled of one on one sessions between the mentors and the teachers after classroom visits and lesson observations. However, in the 1+9 programme the mentoring was not on one on one sessions; rather it was on one to group sessions, with the aim to develop teachers' instructional strategies. In this study, the researcher did not compare intervention programmes to measure which one is better. However, focus was on how the intervention programmes have been adopted by teachers to provide sustainable change in education.

2.16 Conclusion

This chapter reviewed literature from various studies and policy statements in connection with curriculum change and coverage in Mathematics education. The chapter was subdivided into sections covering contextualization of teacher professional development and factors affecting curriculum change among others. The next chapter presents the theoretical framework adopted for this study.

CHAPTER THREE:

THEORETICAL FRAMEWORK

3.1 Introduction

The study aimed at exploring the usage of the curriculum tracker and planer in the schools where the intervention was implemented by PILO to help teachers in curriculum coverage and improve of learning outcomes. The study was framed within the whole teacher approach. Teaching is incredibly difficult, but training teachers and expecting them to adjust their teaching practice is even more challenging. Therefore, this framework helps in understanding teachers' views on taking professional development, which, in this study, is taking on new interventions meant to enhance professional and academic growth. Good teachers nurture their knowledge and skills through constant and deliberate efforts (Sequeira, 2012).

This study explored teachers' attitudes, skills, and practices in using the curriculum tracker. Since this study does not aim to evaluate the intervention but to understand teachers' uptake of the intervention, the framework was deemed useful in explaining the extent to which teachers had learnt and developed new ways to track and cover the curriculum. Furthermore, through using the whole teacher approach, this study sought to explain how teachers and HODs integrated their practices of implementing and managing the curriculum. Lastly, through using the whole teacher approach, this study further explained from teachers' and HODs perspectives their growth in implementing and managing curriculum through using the tracker and other tools in schools.

After studying approaches to teaching, Chen and Chang (2006) posit that the whole teacher approach is domain specific, suggesting that teachers take on the idea that teaching and learning are influenced by domain. Domain specific objectives guide program design and provide the basis for selecting content and appropriate learning experiences to support teacher development in diverse domains (Chen & Chang, 2006). The whole teacher approach holds that implementing new practices requires more than rote applications of skill and knowledge (Beaudin & Grigg, 2001). As teachers implement new practices, they deepen their understanding through the active processes of elaborating and integrating knowledge. Without time and support for the practice, a teacher professional development program is bound to fail

(Borko, 2004). Chen and Chan (2006) state that a whole teacher approach targets teachers' beliefs, attitudes, practices, and skills. The authors further argue that it is multi-dimensional in the sense that it focuses on teacher professional development as a whole. Chen and McCray (2012) are of the same view but extends it to include social/ emotional, cognitive and behavioral aspects of the teachers' growth. While they do not dispute the inclusion of psychological aspects in the whole teacher approach, Chen and McCray (2013) posit that the whole teacher approach focus is premised on understanding teachers' attitudes, knowledge, and practices. This suggests that the emphasis of the whole teacher approach is on teacher attitudes, knowledge, and practices and argues that these aspects play equally important roles in teacher professional development. Focusing on multiple dimensions of development offers teachers multiple pathways to learning. For some teachers, attitudes will be the most important first step; for example, overcoming the fear of failing in teaching Mathematics. The knowledge will help the teacher to teach what is correct and be able to cover the required curriculum. In addition, the practice will assist them in doing the work that needs to be done and will assist and motivate learners to perform in the classroom. The whole teacher approach framework emphasized the holistic development of all aspects of teachers' development, i.e. attitudes, knowledge, and practice (Chen & Chang, 2006a, 2006b, McCray, 2009) because it is based on the premise that teacher attitudes, skills, and practices interact and influence each other.

There is consensus among the above authors on what constitutes teacher professional development, and that their attitude, knowledge and practices play a vital role in understanding their uptake of new ideas or interventions. While looking at psychological aspects of teachers is also critical in understanding the uptake of new ideas or innovations, in this study the whole teacher approach, as described by Chen and Chang (2006), is adopted to understand teachers' and HODs' knowledge, attitudes, beliefs and practices of using the curriculum tracker to track and manage curriculum coverage in the schools.

3.2 Characteristics of whole teacher approach

The purpose of professional development is to build the capacity of current trends and best practices of education. The whole teacher approach is deemed appropriate for this study because understanding the extent to which teachers use the curriculum does not only revolve around knowing its usage, it also involves understanding their attitudes, knowledge and the practices. This aligns with the whole teacher approach as Chen and McCray (2013;9) who articulate that the whole teacher approach attends simultaneously to attitudes, knowledge and practices. The whole teacher approach adheres to the characteristics shown on table 4 below.

Table 3.1: Characteristics of the whole teacher approach

Multidimensional	Programs target teacher attitudes, skills, and practices; offer multiple ways to learn and develop, and accommodate diverse teacher needs and motivations.
Domain-specific	Objectives are based on content and performance requirements of specific professional development domains.
Integrated	Instructional strategies facilitate dynamic interrelationships among attitudes, skills, and practices. Instruction engages the whole teacher, rather than limiting the learning process to narrow, isolated goals.
Developmental	Programs support teacher growth from novice to expert levels of proficiency, promoting continuous growth.

The table above displays the characteristics of the whole teacher approach as adapted from Chen and McCray (2013).

3.3 The Whole Teacher Approach as Multidimensional

The whole teacher approach simultaneously targets multiple dimensions of teacher development, which are attitudes, knowledge, and practice (Chen & McCray, 2013). The three variables play equally important roles in teacher professional development. The focus on multiple dimensions offers teachers multiple pathways to learning (Chen & Chang, 2006). For instance, teachers' attitudes determine the way they take on new ideas. This is more influenced by their philosophy towards teaching and learning and the whole spectrum of the learning process. Their attitude might influence what they choose to know; their knowledge influences their attitude. Both knowledge and attitude influence the practices in the classroom and in the teaching and learning environment. In addition, knowledge can play a pivotal role in teaching and learning as the teacher feels competent enough to try something new in the classroom. Accessing multiple learning pathways allows professional development to build on teachers' motivations and allows teachers to respond to their needs.

3.4 The whole teacher approach integrated

The whole teacher approach is also integrated. It is based on the premise that teacher attitudes, knowledge, and practices interact and influence each other (Chen & McCray, 2012). Working to achieve isolated goals such as increasing teacher mathematics knowledge or specific instructional practice, the approach uses instructional strategies that build on these interrelationships. Building teacher confidence to teach or to implement new practices contributes to teacher readiness to acquire skills and motivates the implementation of new practices. The successful implementation of new practice increases a teacher's sense of efficacy as a mathematics and science teacher and helps to identify specific needs for further knowledge and skills development (Chen & McCray, 2013).

3.5 Effect of context to teacher approach

Changes in attitude, knowledge, and practice are strongly affected by the contexts in which teachers learn and teach in the classroom. The whole teacher perspective, peers and school administrators are a potentially powerful source of support and resources for change (Chen & McCray, 2012). Teachers do not develop in isolation and their learning is a social cognition process that moves from an inter-psychological state to an intra-psychological tool (Vygotsky, 1978). The whole teacher approach puts great effort into the formation of communities of practice in which construction of knowledge, shared learning, and collaboration is the norm

rather than the exception (Raudenbush, 2009). The whole teacher approach stresses promoting all areas of teacher development, attitudes, knowledge and practice; it calls for attention to the interrelationships among these areas of development and emphasizes the importance of learning contexts in fostering the development of the teacher.

3.6 The Whole Teacher Approach as developmental.

The whole teacher approach views professional growth as a developmental process that continues over the course of a teacher's career (Fleet & Patterson, 2001). The whole teacher approach is based on the premise that attitudes, skills, and practices are interrelated in teacher development. The whole teacher approach facilitates the full range of teacher development with programs that help teachers progress from novice to expert levels of competence. Expected outcomes of the whole teacher approach describe qualitative changes in what teachers expect, what they know, and which practices they use in the classroom (Chen & Chan, 2006). These changes equip teachers to go beyond their experience in professional development. They become capable of adapting what they learn, creating new applications for skills, and problem solving as they implement practices. The whole teacher approach uses instructional strategies that promote development, including teaching for understanding and integrating instruction with practice. The whole teacher approach offers teachers multiple pathways to learning and development. Knowledge and skills can be a starting point for professional development; attitudes and practice can also be starting points.

Chen and Chang, (2006) state that there are two fundamental shifts in the whole teacher approach. The first is a shift from the limited concept of teacher training to the expanded framework of teacher development. The second is a shift from focusing on teachers' general attitudes, skills, and knowledge to targeting their development in specific domains of teaching. To promote and sustain these shifts, teachers, administrators, and policymakers must be encouraged to reflect on current practices. The section below briefly describes each of these whole teacher approach components and their particular contribution to teaching effectiveness.

3.7 The focus on whole teacher approach

The whole teacher approach has four characteristics which is multidimensional, domain-specific, integrated and developmental. However, the study focus on the two characteristics which is multidimensional and domain-specific. Multidimensional the researcher was trying to

find the attitude of teachers towards the curriculum tracker and looking to practice if the teacher they do use the curriculum tracker in the schools. Lastly the knowledge they have about the curriculum tracker. In the domain-specific the researcher focus was on the objectives based on the content and performance on learners in the uptake of the curriculum tracker in the schools.

3.8 The principle of the whole teacher approach

As mentioned earlier, the whole teacher approach is premised on three principles; attitude, knowledge and practice. Figure 3.1 shows how the three pillars align with this study.

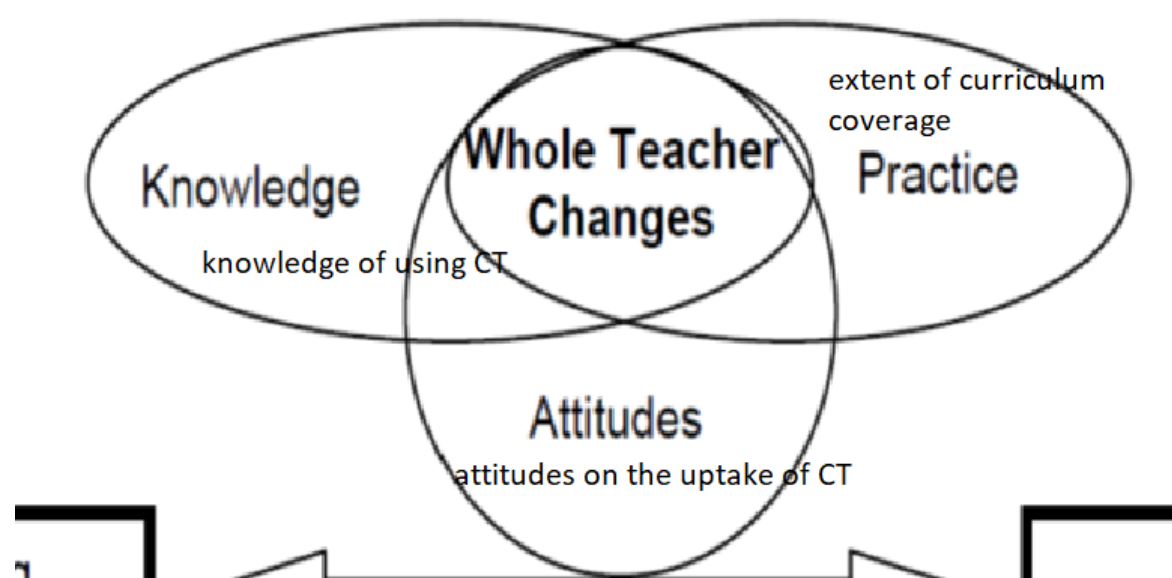


Figure 3.1: Aligning principles of the whole teacher approach with this study

3.8.1 Attitude

According to Chen and Chang (2006), teacher attitude is closely related to knowledge acquisition and classroom practices. The attitude of the teacher is important because it predicts the effect and a positive mind. Attitude affects teachers' thinking, motivation, and behavior as well as mediates the processes of skill development and classroom implementation (Pajares, 1996; Richardson, 1996). The strength of teachers' positive attitudes helps determine how much effort they will have on a lesson, how long they will persevere when confronted with obstacles, and how resilient they will be when faced with adversity (Vartuli, 2005). Teacher attitudes about a content area or an instructional practice are rarely addressed in professional development sessions despite the fact that they are closely related to teachers' knowledge acquisition and classroom practice (Wilkins, 2008). Attitudes toward mathematics and science

leave a strong imprint on children's minds (Davis & Sumara, 2014). The attitudes of teachers affect their degree of commitment to their duties, the way they teach and treat their students, as well as how they perceive their professional growth (Chen & Rovegno, 2000).

The whole teacher framework makes professional development more likely to affect positive changes in teaching; the teacher attitude, confidence and comfort. For example, confidence relates to taking on new interventions, in this case ability to use the curriculum planner and tracker in preparation of teaching. As a teacher gains confidence, they challenge themselves to develop and apply new skills in their teaching. Teachers become less concerned about the problem of not covering the curriculum in class. Teachers become comfortable with using the curriculum planner and tracker to track the curriculum. Once teachers and HODs become conversant with tracking the curriculum, they put more emphasis on strategic ways to manage curriculum; thus, developing supportive communities of learning.

The whole teacher approach recognizes that attitudes and practices are also domain specific. A teacher's comfort level, confidence, and interest may vary by domain. Attitudes affect teacher motivation and progress as well as the implementation of new practices. Practices include teaching methods and materials. The ultimate goal of focusing on teacher attitudes and skills is to improve classroom practice. The whole teacher approach holds that implementing new practices requires more than rote applications of skill and knowledge (Roney et al., 2002). Attitudes influence teachers' thinking, behavior, and motivation (Cassidy, Buell, Pugh-Hoese, & Russell, 1995).

3.8.2 Knowledge

Knowledge is the primary focus of most professional development programs (Chen and MaCray, 2012). As teachers apply knowledge and methods learned through professional development programs, they inevitably encounter unexpected challenges that require adaptations to make the practices effective (Wei et al., 2009). Providing training helps teachers alleviate fears and motivates them to explore, thus influencing their attitude towards a programme. For example, in the case of using the curriculum tracker, teachers and HODs learn how to use the curriculum planner and tracker, gain the knowledge on how it can be used to track and manage the curriculum.

3.8.3 Practice

Developing new practice immerses teachers' knowledge contraction and knowledge internalization processes (Chen & McCray, 2012). Furthermore, Chen and McCray (2012) points out that when implementing the new practices, teachers deepen their understanding through constructive processes of elaborating and integrating knowledge. When the new practice is implemented teachers begin to internalize them, seeing them in relation to their existing practices (Vartuli, 2005). For example, in the case of the curriculum tracker, teachers and HODs need to change their practice to use the new curriculum tracker that is implemented in the schools to make sure that they cover the curriculum.

3.9 The whole teacher approach and Professional Development goal setting

In the whole teacher approach, the teacher is the centre of teaching, implementing curriculum, and implementing new ideas or innovations. However, to teach, and to implement curriculum depends on the teacher attitude towards what needs to be taught or towards what needs to be implemented. This study draws on the whole teacher approach to understand teachers' uptake of new innovations that need to be implemented in order to improve teaching. While in the teaching process the teacher is at the centre, in the implementation of the curriculum the teacher and HOD are the centre because teachers implement the curriculum and HODs manage the implementation of the curriculum. Figure 3.2 below shows the whole teacher approach as it is applied in this study.

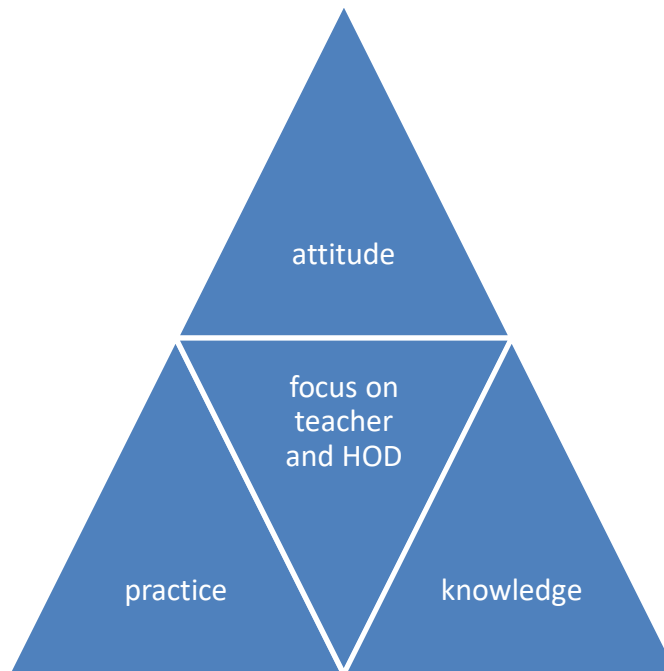


Figure 3.2: The Whole Teacher Approach to Professional Development

3.9.1 Teacher Attitude towards professional activities.

Activities can mean a lot of things such as teaching, participation in professional bodies, and professional development of individuals among others. In this study, focusing on teacher attitudes towards professional activities incorporates both teaching and professional development. Teachers are responsible for providing their learners with quality educational experience, both cognitive and effective (Bruwer, Hartell, & Steyn, 2014). Similarly, they are responsible for their own professional growth. Therefore, if teachers view a new intervention as a contribution to their own growth, they are more likely to approach it positively (Co-Operation & Development, 2009; Graven, 2016a). Teacher attitude towards professional growth can be motivated by, among other things, the environment and co-operative support. For example, as OECD (2009) states, to achieve complex objectives there is need for the creation of opportunities of social, emotional support, exchanging of ideas and practical advice. One of the goals of the curriculum tracker and other curriculum tools is enhancing co-operation among the teachers or among teachers and HODs. Training teachers in the usage of the tracker provides them with the environment and confidence to enhance their teaching. The aspects of reflection in the curriculum tracker lead to creation of opportunities of social and emotional support because through reflections they would be able to engage in professional conversations

among themselves or with an HOD. It further opens the room for exchange of ideas and getting or giving advice about curriculum management. While the curriculum tracker might help in creating such opportunities, if such opportunities are not envisaged by teachers their attitudes might not be positive.

After studying teacher attitudes towards factors influencing classroom practice (Leatherman & Niemeyer, 2005) discovered that teachers' attitudes were more influenced by, among other things, the support they received from resource personnel and their previous experiences. In the case of implementation of the curriculum tracker, the findings from Leatherman and Niemeyer (2005) suggest that teachers' attitude to using the curriculum tracker might be influenced by the support they would get from management and their experiences with similar interventions. The authors further suggest that teachers who receive training along with direct experience are more likely to develop positive attitude towards factors influencing classroom practice. For example, in the case of being given the tracker to use without training and inclusion of experience might promote negative attitudes towards the curriculum tracker itself. The whole teacher approach helps in understanding teacher attitudes toward professional development and usage of the tracker to improve curriculum coverage to not only improve classroom practice but enhance teacher professional development in engaging in professional conversation with each other and with the HOD. It is within these parameters that in this study the researcher opted for enabling factors and challenges since they reflect teacher attitudes.

Professional development interventions are influenced by a number of factors associated with the success of the intervention at the individual level (Gast, Schildkamp, van der Veen, McKenney, & Luyten, 2017). Teachers' attitudes toward new interventions affect their behaviour and also influencing the classroom climate and learners' opportunities for success (Jordan, Schwartz, & McGhie-Richmond, 2009). Moodley, Adendorff, and Pather (2015) posit that the teacher is the most significant barrier to successful intervention. For example, the success or failure of the *JIKA Imfundo* intervention in schools depends on teachers. If their attitude toward this intervention is bad, the intervention is likely to be unsuccessful. However, if their attitude is good, chances are that the intervention will be successful. According to Patrikakou, Ockerman, and Hollenbeck (2016), when teachers have different interventions that

add pressure to educators as they work through one intervention process to meet the needs and deficits of the learners.

3.9.2 Knowledge and skills

Elbaz (2018) focused on identifying what teachers knew that others did not, which she called practical knowledge. Interventions such as the 1+9 programme address the issues of subject matter knowledge. *JIKA Imfundo* aimed at addressing the issue of curriculum development and using the tracker to track the curriculum, which is one way to improve teacher knowledge of curriculum development. Using the whole teacher approach to understand the teacher knowledge and skills of using the curriculum tracker would help in understanding the enabling factors and challenges encountered. One of the pillars of the whole teacher approach is understanding knowledge of individual development. Therefore, understanding teachers' and HODs' knowledge of using the curriculum tracker to track and manage the curriculum, to reflect on the curriculum coverage, and to engage in professional conversation is aimed at looking at the teachers' and HODs' expertise when it comes to curriculum development. Policy makers design the policy but its implementation and development, as Elba (2018) posits, is the responsibility of the teachers and HODs. In the context of South Africa, the integrated quality management system (IQMS) is one tool that is used to measure teacher knowledge of subject, teaching instruction and development of the child holistically. It also includes aspects of professional development but leaves out teachers' knowledge of curriculum development. The curriculum tracker is not a measuring tool; rather it is a means to assist teachers and HODs with curriculum development. However, teachers' and HODs' knowledge of using the tools might be negatively or positively affected by their attitude towards the tool. Understanding what works and what does not work with teachers' and HODs' usage of the curriculum tracker without unpacking their knowledge is not sufficient. Therefore, through using the whole teacher approach, teachers' and HODs' knowledge of the curriculum development was unpacked.

3.9.3 Practice

The goal of teacher development is to improve classroom practice. The teachers apply knowledge and methods learnt through professional development programs, teachers inevitably encounter unexpected challenges that require adaptations to make the practices effective (Chen, 2012). Furthermore, Chen (2012) states that when implementing a new practice, teachers deepen their understanding through constructive processes of elaborating and integrating knowledge. The whole teacher approach recognizes that real practice experiences are highly contextualized and distinct as the classrooms vary greatly from one to the other in learner composition, environmental resources, and teacher expertise. Successful implementation of new practices increases a teacher's sense of efficacy and suggests specific needs for further knowledge and skill development (Bardsley, 2007; Berk, 1985). Classroom practice will be the key; for example, being motivated by the need to teach diverse learners.

Teachers are an important component in classrooms; their practice has influence in the achievements of learners (Coe, Aloisi, Higgins, and Major (2014) . Leithwood and Jantzi (2006) emphasize that teacher classroom practices are clearly intended to improve learning, but may not do so, depending on the level of effectiveness. Chapman (2006) argues that through classroom interaction teachers use the curriculum to interact with learners. For example, in drawing lesson plans, teachers use the curriculum to plan meaningful conversation in the classroom. Therefore, their practices, like attitude and knowledge, plays a critical role in the teaching. The whole teacher approach foregrounds attitude, knowledge and practice as the aspects that determine teachers' uptake of professional development.

In this study, when looking at practices the focus was mainly on teachers and HODs and the extent of curriculum coverage in the schools that were using the curriculum tracker. The aim was to explore the extent to which teachers and HODs were using the curriculum for the purpose of tracking and managing the curriculum in the schools. Teachers are required to consistently plan, track and report on curriculum coverage and reflect on teaching and learning to the HOD. HODs need to regularly check teachers' curriculum tracking and learners' work, work with teachers to improve curriculum coverage and assist teachers with problems relating to curriculum coverage. The main strategic objective was to improve learning outcomes. It was hoped that through the use of the whole teacher approach theory, this objective would be

achieved. If the quality of curriculum coverage improves, then learning outcomes would be improved. In order for the curriculum coverage to improve, the monitoring of the curriculum coverage by HODs should improve.

The intervention was introduced by *Jika Imfundo* to improve curriculum management and strengthen curriculum coverage in schools. Cameron, Owen, and Tee (1986) describe curriculum management as consisting of four stages, namely planning, teaching, assessing and evaluating curriculum objectives. Maringa (2016) posits that curriculum management includes planning, developing, monitoring and reviewing the educational programme of the school goals and appropriate allocation of resources. Hoadley, Christie, and Ward (2009) identify important school curriculum management variables that are linked to improved delivery in relation to curriculum coverage, such as the procurement, and management of books and stationery and quality of tests and monitoring of results.

3.10 Studies using whole teacher approach to understand teacher professional development.

In a study conducted by Chen and McCray (2012) it was emphasised that all three variables play an important role in teachers' professional development. Whilst one of the interventions have been tried with limited success, a whole teacher curriculum approach provides a better means of improving numeracy skills (van de Mortel, Whitehair, & Irwin, 2014). They further state that in the whole teacher approach, teachers need to be known through professional development to seek better ways to help learners and expect them to work hard and then harder still. Leaders (HODs) need to establish a vision, and the art of that vision is that teachers will focus on the mission, have a maximum effort and improve mathematics and science results. The whole teacher approach helps learners succeed, and success is the result of the teachers' success in professional development and the role of the management (HODs) is to create conditions in which teachers succeed (Hoerr, 2013). The whole teacher framework rests not only on attention being paid to its three components, which are attitude, knowledge, and practice but also on the degree to which these components are addressed in an interrelated manner. Attitudes, knowledge, and practice must be approached in a cohesive and comprehensive way, infusing the entire intervention with a perspective that acknowledges the complex process of teacher development.

3.11 Conclusion

This chapter discussed the theoretical framework that underpins this study, which is the whole teacher approach. The chapter further discussed the characteristic of the whole teacher approach in detail and the principles of the whole teacher approach, which are attitude, knowledge and practice. The next chapter presents the research design and methodology.

CHAPTER FOUR:

RESEARCH DESIGN AND METHODOLOGY

4.1 Introduction

The previous chapter presented the theoretical framework. The current chapter presents the methodological processes followed in the study. The chapter first discusses different paradigms and the research positioning adopted in this study. Secondly, the chapter discusses the qualitative design that was adapted to engage with the experiences of teachers in using the curriculum tracker in the schools. Thirdly, research methods sampling, data collection method, and methods of analysing the data are discussed. Finally, the chapter presents issues of trustworthiness and ethical considerations.

The heart of this chapter focuses on research design and methodology. For the purpose of this study, the methodology can be defined as a way of systematically to explain the research problem (Creswell & Creswell, 2017) it may be understood as a science of studying how research is done scientifically. Research methodology is a theory of how an inquiry should proceed (Plomp, 2013)_It involves an analysis of the assumptions, principles, and procedures in a particular approach to inquiry. Methodology is a way of thinking about and studying social phenomena (Corbin & Strauss, 2008). In the quest to understand the phenomena being studied, the following questions drive this study:

- Why have teachers used or not used the curriculum tracker to track curriculum coverage?
- How have the HODs used the curriculum tools to engage in professional conversations with teachers?
- What is the relationship between teachers' use of CT and curriculum coverage?

4.2 Research design

A paradigm is a shared world view that represents the beliefs and values in a discipline, and that guides how problems are solved (Schwandt, 2014). A paradigm is a way of looking at a phenomenon; it guides the researcher on how to make decisions and conduct research (Taylor & Medina, 2013). Flick (2009) states that a paradigm is an integrated cluster of substantive concepts, variables, and problems attached to corresponding methodological approaches and tools. Denzin and Lincoln (2008) Define paradigms as human constructions that deal with first principles or indicate where the researcher is coming from so as to construct meaning embedded in data. Paradigms are, thus, important because they provide beliefs and dictates, which, for scholars in a particular discipline, influence what should be studied, how it should be studied, and how the results of the study should be interpreted (Kivunja & Kuyini, 2017). The paradigm defines a researcher's philosophical orientation and this has significant implications for every decision made in the research process, including choice of methodology and methods. So, a paradigm tells us how meaning will be constructed from the data to be gathered, based on individual experiences. The choice of a paradigm defines the world view an individual chooses to take to understand the world.

4.2.1 Paradigm underpinning this study

This study was guided by the interpretative paradigm because the researcher believes that there are multiple truths, and in research it is critical to understand the world view through the eyes of the participants. Unlike the positivist paradigm, an interpretive paradigm is concerned with understanding reality of the participants in their natural settings. While the critical paradigm emphasises emancipation, interpretivists strive to interpret the world through the eyes of the participants. The main purpose of this study was to explore teachers' and HODs' usage of the curriculum tools meant to assist with curriculum coverage. The researcher is of the view that the uptake of any new interventions in education is dependent on the implementers' attitude and knowledge about that intervention. It is for these reasons that rather than trying to empower teachers or HODs in the usage of the curriculum tracker or judging whether teachers or HOD are using it or not, it is better to explore their attitudes and knowledge leading to their practise of using the curriculum tracker. That world view would provide broader understanding on the enabling factors and challenges associated with the usage of the curriculum tools. It is for this reason that this study was underpinned by the interpretive paradigm

Interpretivists adopt the idea of multiple realities to conduct qualitative research on individuals. Reality is constructed through interaction between language and various aspects of an independent world, while actual words of individuals become the evidence of multiple realities (Creswell, 2007). The interpretive paradigm allows the researcher to view the world through the perceptions and experiences of the participants (Thanh & Thanh, 2015). However, no choice of paradigm is better than the other; it all depends on individual world view and one's choice of research design that best helps in understanding the phenomena being studied. As it is argued by Chilisa and Kawulich (2012), no one paradigmatic framework is correct but it is one's choice to determine the paradigm view that informs the research design and best answers the question of the study. Moreover, interpretivists believe that adopting a cause-and-effect relationship in social sciences is not applicable. Thus, interpretivist researchers aim to explore individuals' perceptions, share their meanings and develop insights about the observed case (Bryman, 2008). In this study, the aim was to understand teachers' and HODs' attitudes, knowledge and practices when it comes to the usage of the curriculum tools rather than trying to understand the cause and effect of usage of the curriculum tools.

4.3 Research design and style

A research design can be thought of as the logic or master plan of research that throws light on how the study is to be conducted. Yin (2017) states that a research design is an action plan for getting from here to there, where 'here' may be defined as the initial set of questions to be answered and 'there' as some set of (conclusions) answers. The main aim of this study was to gain an understanding of mathematics and science teachers' and HODs' uptake of the curriculum planner and tracker. Betram and Christiansen (2014) point out that there are different types of research designs. These include the quantitative research design, the qualitative research design, and the mixed methods research design. Creswell and Clark (2017) explicate that the researcher does not only select qualitative, quantitative or mixed methods to conduct research, but he or she also needs to decide on a type of study within these three choices. Informed by literature, the qualitative research design was deemed suitable for this study.

4.3.1 Qualitative research

Qualitative research is an approach to exploring and understanding the meaning individuals or groups ascribe to a social or human problem (Creswell, 2016). According to Green and Thorogood (2018), qualitative research has a particular role to play in helping the researcher to generate useful knowledge about the topic at a range of levels, from that of individual perceptions through to the perception systems work. The process of research in the qualitative design involves emerging questions and procedures, data typically collected in the participants' settings, data analysis inductively building from particular or general themes, and the researcher making interpretations of the meaning of the data.

This study was located within a broad category of qualitative research design to understand the uptake of the curriculum trackers from teachers' and HODs' perspectives. Attitudes, knowledge and practices cannot be measured but can only be understood from the participant's point of view. The qualitative approach to data is used to gain an understanding of the underlying reasons, opinions, and motivations. It also provides insights into the problem and helps to develop ideas. Qualitative research is often concerned with garnering an in-depth understanding of a phenomenon (Dworkin, 2012). Thus, by using a qualitative case study research approach, the researcher aimed at gaining an understanding of the teachers' and HODs' uptake of the curriculum tracker and other tools.

The qualitative approach provides multiple ways of understanding the inherent complexity and variability of human behaviour and experience (Higgs, Horsfall, & Grace, 2009). Different people in different settings construct their realities based on their perception of reality. Therefore, qualitative research provides an opportunity to understand peoples' perception in their natural settings, and directly speaks to the participants, seeing how they behave and act within their context. According to Corbin and Strauss (2008), qualitative researchers have a desire to step beyond the known and enter into the world of participants, to see the world from their perspective. In doing so, they make discoveries that contribute to the development of empirical knowledge. This study aimed at exploring the uptake of the curriculum tools through understanding teachers' and HODs' attitudes, knowledge and practices. As mentioned earlier, these variables cannot be measured but can only be interpreted from the world view of the participants. By understanding their world view, the researcher hoped to gain insight on the enabling factors and challenges that could be useful as this program would end up being rolled out nationally.

By its nature, a qualitative research methodology allows one to use different research strategies to collect data. Marian (2002), cited in Ndlovu (2014), describes four qualities of qualitative research: (1) qualitative research elicits participation accounts of meanings, experience or perception about concepts; (2) it produces descriptive data; (3) qualitative approaches allow for more diversity in responses as well as capacity to adapt to new development or issues; and (4) in qualitative methods, forms of data collected can include interviews, group discussions, observations, various texts, pictures and other materials. This study makes use of a variety of methods to collect data as it used secondary data collected between 2015 and 2016 by means of surveys and primary data collected by means of interviews between 2017 and 2018. Using a variety of resources in this study collected over a long period of time allows for an in-depth understanding of the phenomena interpreted from different stand points but in the same contexts, in this case the schools.

In qualitative research, the idea is to discover patterns of behaviour or thoughts in a set of texts (Cohen et al, 2011). Creswell (2012) concurs with this idea, and states that the researcher establishes patterns and searches out correspondence between two or more categories. Since the study was based on a qualitative approach, both inductive and deductive analyses were used. This was done through coding the written responses of all the participants. Thereafter, the categories were determined, and patterns and trends that emerged were further analysed. The patterns that emerged were analysed in line with the framework of the whole teacher approach, which emphasises the importance of understanding individual attitudes, knowledge and practices.

4.3.2 The research style underpinning this study

In line with the interpretive paradigm and qualitative research design, a case study was deemed suitable for this study. A case study aims to describe what it is like to be in a particular situation. In doing so it aims to capture the reality of the participant and thoughts about the particular situation (Cohen, Manion, & Morrison, 2011). Case studies are used in design research to analyse a phenomenon, to generate hypotheses, and to validate a method (Teegavarapu, Summers, & Mocko, 2008). A case study method enables a researcher to closely examine the data within a specific context (Zainal, 2007). Case studies, in the true sense, explore and investigate contemporary real-life phenomena through detailed contextual analysis of a limited number of events or conditions, and their relationships.

A case study is a particular strategy for qualitative empirical research that allows an in-depth investigation of a contemporary phenomenon within its real-life context (Yin, 2011). Krusenivik (2016) states that case study research is often described as a flexible but challenging methodology that is most commonly used in social science research. According to Baxter and Jack (2008), a qualitative case study is an approach to research that facilitates exploration of a phenomenon within its context through the use of a variety of data sources. This ensures that the issue is not explored through one lens but rather a variety of lenses, which allows for multiples facets of the phenomenon to be revealed and understood. According to Yin (2003), a case study design should be considered when the focus of the study is to answer the “how” and “why” questions; when you cannot manipulate the behavior of those involved in the study; when you want to cover contextual conditions because you believe they are relevant to the phenomenon under study; and when the boundaries are not clear between the phenomenon and context.

The advantage of the case study is that it can close in on a real-life situation and test views directly in relation to phenomena as they unfold in practice (Flyvbjerg, 2006). Josefsson (2016) Agrees and states that the most obvious advantage is that the case study provides a detailed analysis in the individual case. The case study can also offer important evidence to complement experiments. Yin (2009) argues that in all of the fields, the need for case studies comes from the desire of understanding complex social phenomena. The case study research provides great strength in investigating units consisting of multiple variables of potential importance and it allows the investigator to retain a holistic view of real-life events, such as individual life cycles, small group behavior, organizational and managerial processes, neighborhood change, school performance, international relations and the maturation of industries (Yin, 2009). The case study also provides insight and illuminates meaning that expands the readers’ experiences.

Most critics indicate that it is the case study theory, reliability, and validity that are at issue, thus the very status of the case study as a scientific method is questioned (Flyvbjerg, 2006). Case studies provide very little basis for scientific generalization since they use a small number of subjects, some conducted with only one subject (Zainal, 2007). De Massis and Kotlar (2014)

conclude that the findings and recommendations that case studies provide can be either confirmed or denied in terms of utility and veracity, because of the nature of the case study. Yin (2009) argues that the case study is seen as only a preliminary research method and cannot be used to describe or test propositions. Since the aim for this study is to understand teachers usage of curriculum take in Pinetown and King cethwayo district with no intention to generalise them. These Limitation would not affect the findings of this study.

4.3.2.1 Suitability of the case study for this study

According to Crowe et al. (2011), a case study is a research approach that is used to generate an in-depth, multi-faceted understanding of a complex issue in its real life context. As the study looked at the uptake of the curriculum tracker in schools by the teachers and HODs, the case study was suitable for this study because the researcher set out to find in-depth details of an individual, as the study explored the usage of the curriculum tracker in secondary schools (9, 10 & 11). The main characteristics of the case study is that it provides a high level detail and be able to combine both objective and subjective data to achieve an in-depth understanding. For example, this study will look at two sources of data, which are secondary data and data from interviews.

4.3.3 Sample and Sampling

Sampling is an element of data collection, and is defined by Bell and Bryman (2007) as the fragment or section of the population that is selected for the research process. Sampling involves making decisions about which people, settings, events or behaviors to include in the study and deciding how many people, individuals, groups or objects will be observed. Fagerholt, Christiansen, Hvattum, Johnsen, and Vabø (2010) maintain that sampling involves specifying what precisely will be scrutinized in a particular study. Thus, the researcher needs to come to a decision about the number of individuals to interview and research sites to work within the study.

Being able to select a reasonable number of cases and materials to study makes the research more manageable. This study focused on examining the usage of the curriculum tracker by mathematics and science teachers in grade 9, 10 and 11 and HODs. Since it was underpinned by the whole teacher approach theory, the sample was selected on the basis of how the teachers approached the curriculum tracker. Six cases were selected in KwaZulu-Natal schools, three schools under Pinetown district and three under King Cetshwayo district. The two districts

were selected on the basis that these were the only two districts that had started to use the curriculum tracker since 2015. The schools were selected on the basis that they had participated in almost all the surveys conducted in 2015 and 2016. Therefore, conducting interviews with teachers and HODs was on the basis that they had extensive knowledge of the curriculum tracker since they had been involved since 2015.

4.4.1 Purposive sampling

This study adopted purposive sampling because the researcher made a specific choice about people to include in the sample (Bertram & Christiansen, 2014). Further, the research targeted the one group knowing that the group did not represent the wider population, but simply represented itself. According to Cohen, Manion, and Morrison (2002), purposive sampling involves the researcher handpicking the cases to be included in the sample on the basis that the chosen participants possess the particular characteristics being sought. The aim of this study was exploring Mathematics and Science teachers' usage of the curriculum planner and tracker in secondary schools as well as HODs curriculum management in the schools. For the purpose of this study, secondary schools refer to grade 8 up to grade 12. However, participants chosen for this study were teachers teaching grades 9, 10 and 11 and One HOD. Teachers teaching grade 8 are not excluded; however, in the context of South Africa the schooling system is divided into phases and as such grade 9 falls in the same phase as grade 8 and there was a high possibility that it would be one teacher teaching both grades in one school. Grade 10, 11 and 12 fall in the same phase and there is a high possibility that one of the teachers was also teaching grade 12 or that the HOD was teaching grade 12. Secondly, the focus was teachers' uptake of the curriculum tracker and no other interventions. Interviewing teachers teaching grade 12 could lead to teachers discussing other interventions since there were many interventions aimed towards curriculum coverage in grade 12 in the context of South Africa.

In this study, purposive sampling was used in the choice of district and schools, not teachers and HODs. The two districts are the only districts in KwaZulu-Natal that started using the tracker in 2015. Other four districts only started in 2018; therefore, it is in these two districts that the researcher hoped to get rich data about the uptake of the curriculum tracker. Based on Secondary data, the researcher purposely selected schools that participated in the surveys conducted by PILO, and in that way the researcher confidently knew that the teachers in these schools have been using the curriculum tracker since 2015. Therefore, these schools would

provide rich data about the uptake of the curriculum tracker, clarify the enabling factors and challenges associated with implementation and use of the curriculum tools. Secondly, the secondary data in the form of surveys was mostly done with either the principal or the HOD, leaving out teachers who were core implementers of the tools. The researcher purposely selected such schools in order to get in-depth understanding of the attitudes, knowledge and practices of teachers and HODs.

4.4.2 Participants of this study

The spread of the participants of this study is shown on table 4.1 below.

Table 4.1. Participants of the study

Schools	Participants
ISIZ	Mathematics teacher and HOD Natural science teacher
EKU	Mathematics teacher and HOD Natural science teacher
KWABA	Mathematics teacher and HOD Natural science teacher
TISA	Mathematics teacher and HOD Natural science teacher
PHO	Mathematics teacher and HOD Natural science teacher
ZIPHO	Mathematics teacher and HOD Natural science teacher

While it seems there were many participants, the reality in some schools was that one teacher taught both Science and Mathematics and in some schools that same teacher was also an HOD. All in all, there were 12 teachers and four HODs that participated in the interviews in 2017 and 2018. The selected participant has been involved in the programme since 2015; therefore, they were presumed to have in-depth knowledge of what worked and what did not with regard to the usage of the curriculum tracker. Further, the researcher targeted the one group knowing that

the group did not represent the wider population but itself. The researcher was quite aware that there were so many schools involved in the project from both districts; the selected schools were by no means representative of the whole group. However, the findings from these speak to what is probably happening to other schools.

4.5 Description of the case study schools

4.5.1 Schools in quintile 2

These schools, one of which is situated in a township (EKU) and another one in rural (ZIPHO), are attended by African learners, the majority of whom are Zulu speaking, with the minority being Xhosa-speaking learners. A quintile 2 schools is somewhat disadvantaged, but not under-resourced. It offers academic subjects in accordance with the Curriculum and Assessment Policy Statement (CAPS). There is a shortage of classrooms and human resources. Classrooms are overcrowded; there are about 55–60 learners per class, especially in grades 9 and 10, which makes it difficult for teachers to reach out to every learner. The learners are overwhelmed by the demands of high school, yet some are starting to challenge the educators. Nevertheless, the educators try their best to create an environment that is conducive to teaching and learning.

The schools are situated in a poor and struggling community and is, therefore, a no-fee school. There is also a feeding scheme that caters for learners who come to school on empty stomachs, some of whom even take care of their sick elders at home. At present the crime rate in the community is high. This community is dominated by dropouts who resort to a life of crime. The EKU school enrolls about 1 100 learners a year and ZIPHO enrolls about 952.

4.5.2 Schools in quintile 3

One is situated in a township (ISIZ) and another one in the rural areas (KWABA). The schools mainly enroll African learners. Despite not being well resourced, they do not have sufficient facilities to make teaching and learning possible. The schools offer academic learning areas in line with CAPS. Because facilities are overcrowded, teachers are unable to reach out to each and every learner. The situation is challenging for the teachers. According to the principal of one of the schools, some learners also seem discouraged to learn, for various reasons: one of these, according to the principal, is the lack of a feeding scheme at the school. The teachers find it difficult to teach hungry learners who cannot pay attention in class. The crime rate at the

schools is high. The teachers suspect that negative influences from the surrounding community are to be blamed because learners are socially constructed, relations within the community are likely to spill over into and prevail in the school environment. The school's pass rate is moderate, thanks to the teachers' vigor and enthusiasm for teaching. They also sacrifice their time and come to school on weekends and during holidays, just to make more time to teach learners.

4.5.3 Schools in quintile 4 and 5

This schools which are situated in the suburb are (TISA and PHO). The schools mainly enroll African learners. The schools are well resourced and the school has sufficient facilities to make teaching and learning possible. The schools offer academic learning areas in line with CAPS. The schools are much organized have 25 to 30 learners per class. The teachers do not have a lot of challenges in the school. The learners are paying school fees in the schools. Learners are motivated and working hard together with teachers. The pass rate of the schools is very high. The crime rate at the schools is very low.

4.6 Data collection procedure

Data collection is the systematic approach to gathering information from a variety of sources to get a complete and accurate picture of an area of interest, which enables a person to answer the research questions (Langkos, 2014). Data was collected in two ways. Firstly, the secondary data collected by PILO coaches in 2015 and 2016 namely e.g. questionnaires, survey, school reviews. This form of data was requested from PILO and the department of education, and permission to use it was granted. In 2017 and 2018, primary data was collected by means of interviews with the selected schools. The aim was, firstly, to clarify what transpired in the secondary data and, secondly, to understand the attitudes, knowledge and practices of the teachers when it came to uptake of the curriculum trackers. That information was crucial in explaining the findings in the secondary data and to inform the continuous roll out of the programme. In addition, during engagement with participants through interviews, their feelings, opinions, and attitudes were captured. Such data is valuable in explaining the challenges and enabling factors related to tracker usage. Table 4.2 below summarises the data collection procedure followed in this study.

Table 4.2: Data collection procedure

Research question	Participants	Method
1. Why have teachers used/ have not used the curriculum tracker to track curriculum coverage?	teachers	Document analysis Interview
2. How have the HODs used the curriculum tools to engage in professional conversations with teachers?	Teachers HOD'S	Learners' book Interview
3. what is the relationship between teachers use of CT and curriculum coverage?	Teachers HOD's	Learners' book Interview

4.6.1 Jika Mfundo and Secondary data

The study also relied on secondary data, which is externally sourced data that has been generally collected by another institution or person (Johnston, 2014). According C Bertram and Christiansen (2014), secondary data is collected by others or derived from existing data. The secondary data was provided by Pilo organization, and it was collected in 2015 and 2016 by means of questionnaires, surveys, school reviews and self-evaluation. The permission to use this data was granted by PILO. The secondary data contain the 2015 School Review, 2016 School Review, Self-Evaluation and Survey August 2016 and helps to provide an overview of the responses made by the schools to the instrument. The secondary data was very useful in understanding the extent to which Science and Maths teachers used the tracker and in understanding the HODs' usage of tools to track the curriculum. PILO conducted four surveys in schools within the two districts, namely;

- School Review Survey of November 2015 (SR-2015)
- Self-Evaluation Survey of February/March 2016 (SE-2016)
- Curriculum Coverage Survey of August 2016 (AS-2016)
- School Review Survey of November 2016 (SR-2016).

4.6.2 Semi structured interviews

An interview is a conversation for gathering information. A research interview involves an interviewer, who coordinates the process of the conversation and asks questions, and an interviewee, who responds to those questions. Interviews can be conducted face-to-face or over the telephone. Christiansen, Bertram, and Land (2010) define an interview as a conversation between a researcher and a respondent, but caution that it differs from an everyday conversation in that the researcher sets the agenda and asks pertinent questions. In this study, a semi-structured interview was deemed suitable because the aim was to understand teachers' uptake of the curriculum tracker. Therefore, the aim was to allow the interviewee to express their views freely. In this case, the researcher simply introduced the topic and allowed the respondents to answer the way that he or she wanted, and as the respondent talks the researcher probed further when need arose.

Semi-structured interviews involve a series of open-ended questions based on the topic areas the researcher wants to cover. The open-ended nature of the questions define the topic under investigation but provide opportunities for both the interviewer and the interviewees to discuss some topics in more detail (Mathers, Fox, & Hunn, 1998). If an interviewee has difficulty answering a question or provides only a brief response, the interviewer can use cues or prompts to encourage the interviewee to consider the question further. In a semi-structured interview, the interviewer also has the freedom to probe the interviewee to elaborate on the original response or to follow a line of inquiry introduced by the interviewee. In this study, using semi-structured interviews allowed the researcher to direct the conversation to the phenomena being studied to avoid any diversion from the topic by the interviewees.

Alshenqeeti (2014) highlights four advantages of using interviews as data collections methods, i.e. a) Interviews typically allow more focused discussions and follow-up questions; b) Individuals may offer information in interviews that they would not offer in a group context; c) Interviews can be an excellent source for stories and context; and d) the interviewer can observe the non-verbal behaviours of an interviewee. In this study using interviews typically helped with the focussed discussion on the uptake of the curriculum tracker. Since the secondary data was mainly generated from the principal and HODs, the interviews provided rich data from teachers' perspectives in their own context, and further allowed capturing of factual expression, which could not be captured by means of surveys and questionnaires. Although authors have argued for importance of interviews as data collections methods, every method has limitations.

Merg (2012) has raised limitations that researchers need to guard against when doing data collection, i.e. a) time constraints can be a factor for both the interviewer and interviewees. Since the researcher and the participants were both teachers, careful consideration was taken in order to ensure that interviews do not affect teaching time; therefore, interviews were conducted after school time. Other limitations raised by Merg (2012) are the following; a) interviews have the potential to reduce the scope and sample for data collection, b) the results of multiple interviews may contradict each other or be difficult to analyse, c) interviewees may be biased or represent only a limited perspective on performance issues/themes. In overcoming some of these limitations in this study, one teacher per phase or per grade and one HOD was interviewed. Gathering data from both teachers and HODs assisted in getting different perspectives to avoid bias on the side of the interviewees.

In order to capture the essence of the interviews, note taking and audio recording were used. The audio recorder helped the researcher not to focus on taking notes but to focus on the interview and to capture their facial expressions. Although Cohen et al. (2011) argue that using an audio recorder might constrain the respondent in this study; it assisted in allowing the researcher and participants to engage in a meaningful discussion without the rush to writing down notes and losing the interviewee in the process.

4.7 Data analysis

There are two fundamental approaches to analyzing qualitative data that Roulston and Shelton (2015) talk about, which are the inductive and the deductive approaches. They describe the inductive approach as the process of organizing data into categories and identifying patterns among the categories. These categories, themes, and patterns emerge from the data. In the deductive approach, the researcher starts with a set of categories, which are then used to organize the data. This study drew from both the deductive and inductive approaches. The deductive approach was informed by the guiding principle of the whole teacher approach as shown on the table below, which is adapted from Chen and McCray (2012).

The data analysis process was in two phases. Firstly, data collected by PILO coaches in 2015 and 2017 was analysed to explore what transpired in their survey about teachers' usage of the curriculum tracker and HODs' usage of the tools to support teachers in managing the

curriculum. PILO coaches used surveys to collect data across two districts but in this study, only a few schools were selected for further analysis. The data set used in this study consists of transcripts from the survey materials collected by PILO coaches from the six secondary schools' mathematics and science teachers and HODs in 2015 and 2016 and transcripts from the six interviews conducted in 2017. To further verify data from the interviews, document analysis was used for such documents as the curriculum tracker and learners' exercise books. In analysing these data sets the research adhered to the framework offered and defined by Chen and Chang (2006), which is the whole teacher approach that looks at the teacher development aspect knowledge of the curriculum tracker, practice (the extent of using the curriculum tracker) and their attitude, which can either be positive or negative. In this chapter, the focus is on the positive attitude because it explains the enabling factors associated with usage of curriculum tracker by teachers and other curriculum tools by HODs.

The secondary data from the PILO survey and interview were analyzed and evaluated using the coding and themes. Thereafter, the data obtained through document review was used to corroborate the data obtained from the interviews. While the framework focused on three elements, knowledge, practice and attitudes, the analysis adopted both inductive and deductive processes to analysis data. Firstly, the researcher immersed in the data collected, and then the themes that emerged were coded and some were further collapsed into single themes. Once themes were identified it was then that the framework of the whole teacher approach was infused into the data to explore themes that focus on the aspects of knowledge, practice and attitudes.

Table 4.3: illustrates the goals and objectives of the study

Goal areas	Objectives
Attitudes	<ul style="list-style-type: none">• Teacher and HOD confidence in using the tool• Teacher and HOD attitudes in using the tools
Knowledge and Skills	<ul style="list-style-type: none">• Knowledge and skills of using the tools• Motivated to use the tools
Classroom practice	<ul style="list-style-type: none">• Use the tool track curriculum coverage• Engage learners with appropriate and relevant tasks to achieve learning outcomes
Integrated instructional strategies	<ul style="list-style-type: none">• Teacher instructional strategies adhere to tracker guides, e.g. covering relevant tasks
Development/growth in practice	<ul style="list-style-type: none">• Teacher and HOD improvement in implementing and managing curriculum

While these themes were drawn from whole teacher drive, the data collection process and first stage of data analysis of conversations between the interviewer and interviewees required deeper analysis in order to understand the uptake of the curriculum tracker; therefore, inductive data analysis was used to analyse the transcribed data. This way, thematic coding as proposed by Huberman and Miles (2002) was used. That involved immersion in the data through transcribing and developing categories. Immersion with the data coding, and inducing themes from the transcribed data were paramount in understanding attitudes, knowledge and practices of the uptake of the curriculum tracker. Once codes were identified, the relationship between codes was explored in order to categorise talks about attitudes, knowledge and practices in relation to understanding the enabling factors and challenges related to the curriculum tracker uptake. In the quest to understand data from the participants' perspectives, participants were allowed to express themselves freely in the language of their choice although the researcher asked the questions in English. In cases where participants used IsiZulu to express themselves, the data were transcribed and translated into English where possible. In those circumstances data was shared with the participants for member checking.

4.8 Validity and Reliability and Rigour

Validity and reliability are key aspects of all research. Particular attention to these two aspects can make the difference between good research and poor research, and can help to assure that findings are trustworthy (Bertram & Christiansen, 2014). Validity in qualitative research means appropriateness of the tools, processes, and data (Lawrence, 2015). These include checking if the research question is valid for the desired outcome, the choice of methodology is appropriate for answering the research question, the design is valid for the methodology, the sampling and data analysis are appropriate. Reliability refers to exact explicability of the processes and the results (Lawrence, 2015).

Trustworthiness does not only demand the integration of multiple sources of evidence but also must continually take place over time (Cope, 2014). As mentioned earlier, the first phase involves analysing the secondary data, already collected by PILO coaches. Then the data is substantiated by means of semi-structured interviews, which allow the voices of the teachers and HODs, who are implementers at the school level, to come out. Therefore, the data collection was carried over time, using multiple methods.

4.9 Ethical considerations

To ensure that all ethical issues were appropriately addressed, a letter outlining the nature, process and purpose of the study was given to the department of education and principals of the schools seeking permission to conduct the study (see Appendix B). Letters of informed consent were given to all the participants to read and sign (see Appendix C). In the letter, it was clearly stated that participation was voluntary, and that participants could withdraw anytime they wanted to, only needing to inform the researcher if they wished to do so. Participants were made aware of their rights as participants when they read and signed the statement (Choy, 2014). Before the commencement of the study, the researcher clearly explained and emphasised such issues to participants. This was done to ensure that participants understood that they were under no obligations to take part in this study. Before data collection, ethical clearance from the university (Certificate number HSS/0758/018M) was secured to ensure no harm to the participants (Scott, 2013).

Autonomy refers to the right of an individual to determine what activities they will or will not participate in. Implicitly, full autonomy requires that an individual be able to understand what they are being asked to do, make a reasoned judgment about the effect participation will have on them, and make a choice to participate free from coercive influence. To ensure autonomy, participants were given the consent form to fill, which explained everything that would take place in the process of this research. The informed consent document made it clear that the study was a research study and not clinical therapy. The potential participants were informed as fully as possible of the nature and purpose of the research, the procedures to be used, and the expected benefits to the participant and/or society, the potential of reasonably foreseeable risks, stresses, and discomforts, and alternatives to participating in the research. To ensure disclosure, the researcher explained everything to the participants before they took part in the study. The participants signed the consent forms.

The participant must understand what would have been explained in relation to the study and in relation to their participation, and must be given the opportunity to ask questions and have them answered by someone fully conversant with the study particulars. To ensure that the participants understood what was explained or written in the consent form, the participants were asked to indicate and ask questions where they did not understand. Justice demands equitable selection of participants, i.e., avoiding participant populations that may be unfairly coerced into participating, such as prisoners and institutionalized children.

4.10 Limitations of Data collection

The major obstacle that was encountered in this study is that participants were not willing to give the researcher their curriculum tracker as well as the learners' exercise books for checking whether the curriculum tracker had been used. Also, the amount of time required for the interviews was long. Therefore, the other limitation was that the teachers and HODs were not available in the schools, and they refused to be interviewed for more than an hour. Lastly, a participant withdrew from the study. To deal with all these limitations I believe spending time with participants before data collection process and share the ideas of this study would assist in developing the trust between us. Also Selecting participants across grade would help to fill the gap in case other participants withdraw.

4.11 Conclusion

In conclusion, this chapter has highlighted the major methodological considerations of the study. It has contextualised the study for the presentation of data. The next chapter presents primary data that was collected by means of interviews.

CHAPTER FIVE:

ENABLING FACTORS ASSOCIATED WITH CURRICULUM USAGE

5.1 Introduction

In the previous chapter the focus was on the research design and methodology. The chapter explained how the study was conducted. In the previous chapter, methodology design, methods of data, sampling and purpose, issues of trustworthiness of the study and limitation were explained in detail. The aim of this study was to explore teachers' and HODs' usage of the curriculum tools, focusing on the enabling factors leading to effective usage or challenges leading to minimal or no usage of the curriculum tracker by teachers and other curriculum tools by HODs. The research questions highlighted in chapter one pertain to understanding these factors. The study focused on two districts, namely Pinetown and King Cetshwayo because it was in these two districts that the curriculum tracker and curriculum tools were piloted. Out of all the other districts in KwaZulu-Natal that are now using curriculum trackers and tools, Pinetown and King Cetshwayo are the only two districts that had been involved in the project for more than three years where this study was collected.

The research questions guiding the data collection process and findings were:

- Why have teachers used or not used the curriculum tracker to track curriculum coverage?
- How have the HODs used the curriculum tools to engage in professional conversations with teachers?
- What is the relationship between teachers' use of CT and curriculum coverage?

In this Chapter the researcher presents the results on enabling factors that enhance teachers' usage of the curriculum tracker. The aim was to respond to part of research question one and research question two about enabling factors leading to usage of the curriculum trackers and HOD engagement with teachers in professional conversations to manage curriculum through

using curriculum tools. In keeping with the ethical principle of anonymity, the results are analyzed in terms of schools. The researcher chose to use pseudonyms to refer to the schools that participated in the study, and these are: ZIPHO, ISIZ, PHO, ECU, TISA and KWABA.

Data presented in this chapter and the subsequent chapter was collected from 2015 to 2018. From 2015 to 2016, data was collected by PILO by means of school review survey of November (SR-2015), Self-evaluation of February/March 2016 (SE-2016), Curriculum Coverage survey of August 2016 (AS-2016), School Review Survey of November 2016 (SR-2016). The data was collected in almost all the schools in the two districts. However, for the purposes of this study only six schools were selected, three in each district and based on their participation in the survey conducted by PILO. The first part of the analysis involves analyzing secondary data from PILO and primary data collected in 2017 and 2018 by the researcher. While the secondary data reveal that some teachers, do use the tracker effectively and some do not, it never explored the factors leading to the usage or no usage; therefore, the interviews aimed to bridge that gap. The introduction of the curriculum trackers was to assist with curriculum coverage, but the secondary data collected in 2015 and 2016 does not reveal the extent to which the usage of curriculum trackers has contributed or not contributed to curriculum coverage; thus, the interview further aimed to explore that. The shortfall identified with the survey, which prompted further interviews in 2017 and in 2018, was that the survey was either conducted with the principals or HODs; only in a few instances where the views of the teachers, as obvious implementers of curriculum tracker, were heard. Therefore, the researcher deemed it necessary to conduct interviews since the intervention was targeted at the teachers to improve their knowledge, practice, and attitudes towards curriculum coverage.

5.2 Findings associated with enabling factors

Among six schools whose data were analysed in this study, two schools were reviewed in 2015 (SR-2015), and these are KWABA and ZIPHO. The other four schools were reviewed in 2016 (SR-2016), and include TISA, PHO, ISIZ and ECU. Only mathematics teachers were reviewed in 2015 and in 2016 both mathematics and science teachers were reviewed, including their HODs.

5.2.1 Usage of curriculum tracker and curriculum tools in schools

After analysing the data from the 2015 survey, one theme emerged, which is minimal usage of the curriculum tracker. Minimal usage transpired when teachers claimed that they did use the tracker but had no evidence to back the claim or when claimed to use the tracker only sometimes. However, the researcher opted to explore this further even though it was considered minimal in order to understand enabling factors that promoted the usage of the tracker. The researcher was interested in the teachers' perspectives even if it could not be verified by means of analyzing the tracker itself. The extract below is taken from the 2015 survey where the two schools ZIPHO and KWABA were reviewed. The extracts below from the two schools evaluated in 2015 showed that teachers are using the curriculum trackers either routinely or to some extent.

Question 1: (<i>HODs and teachers</i>)	Yes	To Some Extent	Don't know	Not at all
1. In your opinion are the trackers being used routinely?	X			

Figure 5.1: Extract from ZIPHO

Question 1: (<i>HODs and teachers</i>)	Yes	To Some Extent	Don't know	Not at all
1 In your opinion are the trackers being used routinely?		X		

Figure 5.2: Extract from KWABA

Although the tracker was used by teachers, the 2015 survey was done with HODs to find out whether teachers in the schools did use the curriculum tracker or not. In cases where the HOD was also a mathematics or science teacher then the teacher served both purposes of using the CT to track curriculum and using other curriculum tools to support teachers in tracking and managing the curriculum. ZIPHO HOD was one such example, as he was the teacher expected to use CT to manage and track curriculum and use other tools to support other teachers to manage curriculum. From the extract, at ZIPHO the HOD reported that teachers were using the

curriculum tracker routinely. However, there was no evidence to back this claim. At KWABA, the HOD agreed that not all teachers, especially in mathematics, were using the tracker. To elaborate further on this, the HOD revealed that although teachers were confused in the initial stages, after attending more trainings they started to use the trackers. The conversation is captured in the extract below:

Please elaborate on what is working and where you need more support from Jika 'iMfundo

At initial stages of its introduction, there was some anxiety leading to confusion, but later there they adapted and confidently started using it. The confusion was around a number of textbooks, they thought they need to use all of those that are captured in the tracker.

They indicated that they like them because they provide direction as well as make it easier for them to plan and execute in class. Subject advisers have given them lesson plans that are also helpful, so they use the tracker and those lesson plans interchangeably.

So, they don't always use the tracker daily, but frequently.

It is noted that the tracker has packed a lot of content to be covered in a week in line with caps. Therefore, it is impossible to cover curriculum.

They need more support to improve their confidence in the use of the tracker as a tool for curriculum delivery.

Figure 5.3: Extract from 2015 survey

In the extract above, a few things were commented on by the HOD, highlighting enabling factors that enhance the usage of the curriculum tracker. Firstly, on the knowledge to use the tracker, drawing from the above extract it appeared that once teachers' confusion was cleared they started to use the tracker and they recognised its effectiveness with respect to planning, and its flexibility to be used in conjunction with other tools such as lesson plans; thus, suggesting that from the perspective of the HOD teachers had gradually developed a positive attitude towards the usage of the tracker. However, without the evidence to back the claim the findings can be construed as self-reporting.

In 2016, all six schools participated in the survey and the survey focused on both Mathematics and Science teachers' usage of the curriculum tracker and HOD usage of the curriculum tools to manage the curriculum. Furthermore, in 2016 the focus was also not just on individual usage but whole school usage, and as a result one survey was conducted with the principal of the schools to rate the school usage of the curriculum tracker using colour coding as shown in the table below.

Table 5.1 extracted from PILO data

Green color	Amber	Red Colour
Meaning the school use the curriculum tracker routine.	Meaning that the school uses sometimes not always, somehow they still need some assistance.	Meaning the school is not using the curriculum tracker at all

In this chapter the focus is mainly to understand enabling factors associated with curriculum usage and HOD usage of the curriculum tools to engage in professional conversation, with the aim to manage curriculum together with teachers. Although the above survey was done with the principal, the researcher included it because it reflects the work done by teachers and HODs as they come to be understood by the principal. The focus of the survey was on the usage of the curriculum tracker, not principal perspectives on the usage of the curriculum tracker; therefore, analyzing it would provide the understanding of the usage of the curriculum tracker from the whole school perspective and not just that of an individual HOD. Since the aim of this chapter is to provide enabling factors among the themes that emerged, the researcher in this chapter focuses on the themes associated with routine usage and minimal usage by both HODs and teachers. Although the intention was not to compare the usage of CT between Mathematics teachers and Science teachers but to provide a holistic view, since the secondary data provide data separately, the researcher decided to do the same and later discuss the emerging themes.

5.2.2 Mathematics teachers' and HODs usage of the curriculum tracker and curriculum tools

Based on self-evaluation of February/March 2016 (SE-2016), out of six schools only one school colour coded itself as green, which means the teachers were using the curriculum tracker routinely in their subject. Three schools colour coded themselves as Amber, suggesting minimal and these are EKU, TISA and ZIPHO and two schools, ISIZ and KWABA, did not evaluate themselves. PHO is one school that was coded green, suggesting routine usage. Even in the questionnaire, they confirmed that they use the curriculum tracker routinely as shown in extract 5.3 below.

	All	Some	None	Do not know
1. Of the Grade 8-9 Maths teachers you supervise, how many use the Maths planners and trackers routinely to track coverage?	X			

Figure 5.4: Extract from PHO

The verification from PILO coach does confirm that mathematics teachers at PHO do use the tracker routine as shown in the extract below.

<i>Verification using Term 3 Trackers:</i> <i>Trackers are used routinely and are up to date (Note it is possible for the tracker to be up to date but for the teacher to be behind with CAPS)</i>	X			
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Extract 5.5: Verification of tracker usage by PILO coaches

Unlike the findings from the 2015 survey where there was no evidence to back the claim of curriculum tracker usage, evidence does confirm that teachers were using the curriculum tracker; however, nothing is mentioned when it comes to HODs' engagement in professional conversation with teachers about curriculum management.

Of the six schools, three schools coded themselves amber, suggesting that not all teachers were using the curriculum tracker or using it for the purpose intended for. Contrary, in the questionnaire it appeared that two of the four schools was actually using it as captured in the extracts below.

	All	Some	None	Do not know
7. Of the Grade 10 -12 Maths teachers you supervise, how many use the Maths planners and trackers routinely to track coverage?	X			

Figure 5.6: Extract from EKU

Based on the questionnaire, it means three schools out of the six used the curriculum tracker routinely. Although not conclusive, one might think that in some schools colour coding evaluation and response to the questionnaire were done by two different people to justify the discrepancies in the responses. The comment from PILO coach, even though not refuting the response to questionnaire reveal that there was no evidence to back the claim that all teachers were using it since no curriculum trackers were available to be checked, thus suggesting self-reporting as it was evident in the 2015 survey.

Verification using Term 3 Trackers: Trackers are used routinely and are up to date (Note it is possible for the tracker to be up to date but for the teacher to be behind with CAPS)				
Comments: COULDN'T VERIFY USING TRACKERS AS THE ONLY AVAILABLE TRACKERS WERE FOR THE NEW TEACHER WHO JOINED IN TERM 4.				

Figure 5.7: Verification of tracker usage by PILO coaches

The other two schools, namely ZIPHO and TISA who coded themselves amber in the self-evaluation also confirm in the questionnaires that not all teachers used the curriculum tracker as evident in the extracts below

	All	Some	None	Do not know
1. Of the Grade 8-9 Maths teachers you supervise, how many use the Maths planners and trackers routinely to track coverage?		✓		

Figure 5.8: Extract from ZIPHO

	All	Some	None	Do not know
1. Of the Grade 8-9 Maths teachers you supervise, how many use the Maths planners and trackers routinely to track coverage?		✓		

Figure 5.9: Extract from TISA.

Although from the extracts above one can conclude that some schools did use the curriculum tracker routinely and some use it to some extent except as indicated in the 2015 survey, one cannot understand much about enabling factors leading to the usage from the survey. One thing that is evident from the 2015 and 2016 surveys is that although HODs and principals argue that schools did use the curriculum tracker, only in one school (PHO) was there evidence to back claim. However, even so one cannot argue against the claim without having evidence to prove otherwise. As result of the lack of evidence supporting the usage of the curriculum tracker from secondary data, interviews were conducted to bridge the gap. To understand Science teachers' usage of the curriculum tracker, responses to survey about Science teachers' usage were analysed.

5.2.3 Science teachers' and HODs' uptake of the curriculum tracker

Science teachers did not participate in the 2015 survey; therefore, the analysis focuses on the data collected since 2016. Just like in Mathematics, PHO evaluated herself green, suggesting routine usage of the curriculum tracker, and ZIPHO, ECU and TISA evaluated themselves Amber while ISIZ and KWABA did not evaluate themselves. As it was the case in mathematics, the extracts from PHO showed routine usage of the curriculum tracker as depicted below.

	All	Some	None	Do not know
4. Of the Grade 8-9 Science teachers you supervise, how many use the Science planners and trackers routinely to track coverage?	✓			

Figure 5.10: Extract from PHO

EKU is the only school evaluated themselves as amber yet indicated routine usage in the questionnaire. The verification by PILO coaches also confirmed routine usage.

<i>Verification using Term 3 Trackers:</i> <i>Trackers are used routinely and are up to date (Note it is possible for the tracker to be up to date but for the teacher to be behind with CAPS)</i>	X			
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Figure 5.11: Verification of tracker usage by PILO coaches in science

In supporting their response in the questionnaire the HOD from ECU commented as follows:

Comments: Science is not as abstract as Mathematics and is, therefore, easier to grasp. The CASS Activities assist in making lessons more enjoyable and understandable for the learners.

Figure 5.12: Extract ECU HOD comments

Although not explicitly said, from the comment above it can be concluded that the HOD was insinuating that the teachers were using the curriculum tracker because the activities suggested help in making lessons enjoyable. The evidence in the above extracts shows that only two schools routinely used the CT. Both PHO and ECU HODs raised the issue that Science teachers found it easy to use the curriculum tracker as compared to Mathematics teachers who complained about packed curriculum and argued that they struggled to keep up with the content to be covered. For the other two schools, namely TISA and ZIPHO the responses from the questionnaire confirmed that the tracker was not used as routinely as was indicated in self-evaluation. There was no contradiction between the self-evaluation and responses to

questionnaires as it was the case for Mathematics there was consistency to how they evaluate themselves and their responses to questionnaires.

ISIZ and KWABA did not do the self-evaluation but they did respond in the questionnaire. In the questionnaire ISIZ claimed routine usage.

	All	Some	None	Do not know
4. Of the Grade 8-9 Science teachers you supervise, how many use the Science planners and trackers routinely to track coverage?	X			

Figure 5.13: Extract ISIZ response from the 2016 survey

The verification by PILO coaches contradicted the responses by HODs, thus suggesting that even though curriculum trackers are used this is not done effectively.

<i>Verification using Term 3 Trackers:</i> <i>Trackers are used routinely and are up to date (Note it is possible for the tracker to be up to date but for the teacher to be behind with CAPS)</i>				
Comments: Term 3 and 4 were not covered and 2 teachers are sharing Science and Life Sciences at grade 8-9 so it works against the school but have advised the HOD to come out with a strategy to make sure that teachers plan on how they will make sure that the curriculum is covered.				

Extract 5.14: verification of tracker uses by PILO coaches.

From the above extracts from PILO coaches it seemed lack of planning is the challenge. However, in this chapter the focus is on enabling factors, and the researcher decided not to dwell much on these challenges since they are dealt with in the next chapter.

Evidently from the above data that there are schools that consistently use the tracker routinely whether in Mathematics or in Science. However, there is limited information on the enabling factors, and as such primary data by means of interviews was conducted with Mathematics and Science teachers. Secondly, as evidenced in the above data surveys were mostly conducted with HODs. Although HODs are involved in managing the curriculum, the teachers are the ones who are supposed to work towards covering the curriculum and the curriculum tracker was designed to help them overcome the difficulties associated with curriculum coverage. In the section to follow, the researcher presents data from the interviews collected in 2017 and 2018. The data was collected from both teachers and HODs.

5.7 Teachers' and HODs' usage of the curriculum tracker: interviews

After analyzing the data, two themes emerged that reveal enabling factors for the usage of curriculum tracker. Twelve teachers were interviewed, six teachers teaching mathematics and six teachers who were teaching science and four HODs. In the two schools, ZIPHO and TISA, in 2017 there were no HODs in the mathematics and Science disciplines because they had been transferred to other schools.

All twelve teachers interviewed said they were using the curriculum tracker, with a few indicating routine usages but the general view was that it was used. One of the reasons raised by the majority of teachers was that the curriculum tracker was easy to use as compared to the curriculum and assessment policy statement (CAPS) and annual teaching plan (ATP) because of the breakdown of the topics. They, therefore, found these helpful in determining what exactly needs to be done in a particular day. However, Mathematics teachers also raised a lot of concern around the same point, which will be dealt with in the next chapter. In addition, most teachers indicated that the curriculum tracker was useful when it comes to checking the topic to be taught and the extent to which the topic should be covered. Teachers also pointed out that the curriculum tracker assisted them in planning for their lesson as it was more detailed and more specific than the ATP, showing everything needed to be taught under each topic.

All teachers were asked the following questions to find out about their usage of the curriculum tracker, and samples of verbatim responses are excerpted. PHO TM refers to the mathematics teacher at PHO School, PHO H refers to the HOD at PHO and TISA ST refers to the science teacher from TISA school.

The following question was asked by the researcher: In your own understanding, what is the purpose of the curriculum tracker? In response to this interview question, some participants responded as follows:

Tracker is a guide for the teacher to plan for each day, it does not mean you have to go through the tracker every time but it is there to help you as a teacher so that you be able to see what to do and when and how long you have to do it (PHO MT).

I think it gives guidance and to make sure that we finish with the syllabus, further tell everything I need to do in the class every day (ISIZ MT).

To guide the teacher, on what to do on the particular day (KWABA ST).

I use the curriculum tracker all the time because of it the only thing that guides me. As much I do not complete by writing the dates in the curriculum tracker but I do tick that I have done this and done that (EKU ST).

Mmmm I am using the spot on a workbook, it also has the information in the face page that tells you what to do in the first term it goes hand in hand with the tracker. Its purpose I think to guide me on what to do in the particular term (TISA MT).

Based on the above responses from teachers about the purpose of the curriculum tracker, it would seem that the teachers identify almost the same purpose of the curriculum tracker; that it is there to guide teachers.

A total of 50 percent of them indicated that the pace in the curriculum tracker was good because it helped them to pace themselves so that they could finish the curriculum. However, some did not agree with its pace as they said it was too fast and it did not accommodate those learners who were slow. The teachers also mentioned that they were able to see if they were going fast or slow and tried to do as the curriculum tracker directed in terms of what to do and when to do it.

The second question that the researcher asked of the respondents was: How is the pacing affecting the curriculum mastery of the learners? Some of the responses to this question are excerpted below:

I think the pace is very good. Sometimes it helps I can be able to see how much left in the curriculum and to pick up the pace. In my planning I use it. Even today I knew that the activity that I will give them today was supposed to be done last week too I am behind I need to pick out my pace (ZIPHO MT).

The pace is alright but the problem lies with the learners. You see they are very slow. They have a negative attitude towards mathematics, you see it like 10 or 15 learners who are doing very well and the rest they are struggling so the pace is good for the curriculum to be covered (EKU ST).

I think the pace it right in all topics, however in geometry is too fast sometimes you need to go back the time allocation in this topic is not enough because of it, not the easy topic for learners (ISIZ MT).

Based on the responses from teachers about the pace of the curriculum tracker excerpted above, their views were different as some said the pace was good and some said it was too fast. The researcher will discuss the views of the teachers that said it was too fast and other challenges in the next chapter.

Some teachers further commented that they found the curriculum tracker to be useful since it referred them to different books that they could use to find additional information. ZIPHO MT concurred with ZIPHO ST who said;

and ST we know as teachers that we need to use more than one book but to sit down and check the information from all the books (kuyagqilaza) meaning its time consuming. So the tracker (iyangitshengisa) do refer me to which books I can use to find additional information.

Similar sentiments were raised by the KWABA MT who stated that;

Ngiyayithanda ngoba iyangisiza ukuthola information in other books, meaning I like it because it helps me find additional information in other books.

Several other teachers agreed and further indicated that the curriculum tracker also provided activities that needed to be done in class by learners. Science teachers, mostly, said the curriculum tracker made their work very easy as all the activities that they needed to give to the learners were provided.

The researcher probed further to find out if the activities suggested were covered. The aim was to explore if the usage of the tracker by the teachers was meant for curriculum coverage. Below are some of the responses solicited from the respondents:

During the workshop of I+9 we were given the lesson plan with activities and the curriculum tracker has its own activities. I used them both at first on a particular day I will use the one on the lesson plan and another day I will use the curriculum tracker. Then I find that the activities are more like the same, it a repetition than I

decided to use the one on curriculum tracker. However, I did not cover all the activities in the curriculum tracker but I did more than 75% because I was using both lesson plan and curriculum tracker (KWABA MT).

In grade 8 and 9 I have different books if I see that learners are struggling in during activities I gave them, I use another textbook. I think I manage to do all activities that learners need to do (TISA MT).

I think I finished 90 percent of activities. We have two books platinum, clever and other books. But mostly I use the platinum in the classroom. However, I do refer to clever. Learner textbooks are not enough but we depend even on the workbook to finish all the activities because they are more like the say from the textbook (EKU ST).

Teachers seem to have enjoyed using the curriculum tracker in their subjects as they felt that it was flexible because it allowed them to use different books in mathematics and science. It did not restrict them on which book they were supposed to use in the classroom. All the teachers indicated that the curriculum tracker was very helpful because it assisted them in providing assessment tasks for learners. The teachers indicated that it was very hard to think of an assessment to give to learners, such as investigations and assignments. The curriculum tracker helped with setting the papers up to the department standard. The curriculum tracker provided the investigation that was suitable for learners, which covered everything at the cognitive level.

The researcher also asked: If you were using the tracker all the time, then provide enabling factors that motivated you to use the tracker all the time? Some participants indicated thus:

The curriculum tracker helped me a lot in providing the assessment tasks in learner and I used them for revision purpose (KWABA MT).

The curriculum tracker it helped a lot with investigations and assignments because of some of us it not easy to set the tasks that are up to standard for learners (ZIPHO MT).

The curriculum tracker assists me a lot to give my learners I do not have stress now of assessment. However, sometimes I do use assessment tasks from other sources but assessment from curriculum tracker ayasiza kakhulu [help a lot] (EKU MT).

The responses above indicate that the teachers were not using the tracker all the time. However, the tracker assisted them in terms of assessments in the classrooms.

Although teachers and HODs alluded to some factors that enabled them to use the curriculum tracker and curriculum tools, there was also a hint to suggest there was modification of the tracker by the teachers to suit their needs. Therefore, the researcher asked the following question: Do you have any suggestions on modifying the tracker? Some of the responses are below:

Mmm, I find it very simple and straight forward so I do not think it should be modified. As it is fine. One thing I do not understand, it how to record dates. The way they structured the date columns. It was a bit confusing for me. That the only one thing I think needs to be modified. It is not clear; I think it should have one column for the dates (KWABA ST).

Ok, mmmm the curriculum tracker is very specific on what to do on a particular day. I do not spend much time trying to figure out what to do on a particular day because I just look at the tracker. The tracker will tell you what to do, I have enough time to go to the class and deliver the content for the learner (PHO MT).

I like to use the tracker because it works hand in hand with the ATP and helps me to see what is left to teach in class (EKU ST).

No, it helps me can be able to see how much left in the curriculum and pick up the pace. In my planning, I use it every day. Even today I knew that there is the activity that I will give them but this activity that I will give today I should have given them last week so it helps me to see how behind I am with my work and try to push (ZIPHO MT).

It can be concluded from the above responses of the teachers that one of the reasons teachers used the curriculum tracker was that it helped them to follow the extent of curriculum coverage. Even though it was evident in many that they were still behind with the curriculum, the important thing was that they were quite aware that they were behind.

Although teachers alluded to the reasons as to why they used the curriculum tracker as in the surveys done in 2015 and 2016, this was all based on self-reporting because of the twelve teachers interviewed in the six schools, only few could provide the curriculum trackers for verification and only two had their curriculum trackers filled for all the terms. Some teachers had the curriculum tracker with them but it was not completed or just half completed. For some, like EKU, it was completed but the activities in the learner's book contradicted what was indicated in the curriculum tracker. EKU ST commented that he completed the dates as specified in the curriculum tracker but taught according to what he saw fit in the classroom. For example, based on the CAPS and curriculum tracker the content to be taught was Pythagoras theorem but activities in the learners' book were about circles. Although the HODs insisted that the teachers did use the tracker routinely, the discrepancy in what was covered in the learners' book and what was supposed to be taught made one question the term routine usage it simply meant ticking in the books the date completed or it meant using the curriculum tracker to track the curriculum. Although there were those discrepancies, which Mkhwanazi, Ndlovu, Ngema and Bansilal (2017) explored in detail, the aim of this study was not to explore discrepancies but to explore the enabling factors leading to usage of the curriculum tracker and challenges leading to non-usage or minimal usage of the tracker. Regardless of those discrepancies, it seems that there are aspects that teachers and HOD found useful in the curriculum tracker and curriculum tools.

5.2.3 HOD usage of curriculum Tool and management of curriculum tracker

In the above discussion, the usage of curriculum tracker by the teachers show that the teachers had started to use the curriculum tracker in schools. The responsibility of the HODs was to use the tracker from the teachers to track curriculum coverage. Therefore, the HODs, in their plan of schedule had to plan on when to meet with teachers to sign the curriculum tracker and check if the curriculum was covered. They also were supposed to plan with the teachers accordingly on where curriculum coverage seemed to be lacking. Therefore, HODs were provided with the curriculum tools to manage the curriculum tracker in the school. In the six schools that were interviewed, only four HODs participated in the study. The other two schools indicated that, for different reasons such as transfers, there were no Mathematics or Science HODs in their schools.

According to the HODs, the curriculum tool helped to manage their work very easy. HODs indicated that usage of curriculum tools helped them to manage their work and the work of teachers in their departments. The HODs pointed out that the teachers had been struggling with finishing the curriculum of their subjects, but since the arrival of the tracker the teachers were able to cover everything because it paced the teacher. In trying to understand HODs' perspectives on the curriculum tracker and curriculum tools, the researcher asked the following question: In your understanding, what are the purposes of the curriculum tracker and curriculum tools? Some responses to this question are capture below:

The purpose of the tracker according to my own understanding is to guide teachers and help us for planning and also help us and make sure we cover the curriculum. The curriculum tool helps us as HODs to track teachers work in the classroom (PHO H).

In my own view, it says when you go to the class you need to plan the lesson from this time to this time. The curriculum tracker indicates that you need to cover this topic with this time. Even its name says tracking so the teacher needs to track his/her work in teaching. Therefore, it all about planning. Also, they are a reflection part was the teacher need to say what went right or wrong in the lesson and how to improve next time (EKU H).

TISA H: I think is to help teachers to cover the curriculum. The fact that teachers are able to cover the curriculum indicates the change. The teachers indicated that some concepts were not covered in the previous years but that is not the case this year in 2018 as the HOD I know exactly how to support teachers (TISA H).

Based on the above responses from some HODs about the purpose of the curriculum tracker and curriculum tool, it would seem the HODs believed that the curriculum tracker was all about planning and tracking the curriculum coverage for teachers.

The HODs pointed out that some teachers were using the curriculum tracker but others were not yet using it fully as required. Teachers were still complaining about too much paperwork. Three HODs said the teachers are using the curriculum tracker to some extent, and the other HOD said the teachers were using the tracker routinely.

The next question the HODs were asked was: To what extent are teachers using the curriculum tracker? The following are responses to this question by some of the HODs:

To some extent because the evidence that teachers used the curriculum tracker, it where a teacher recorded the dates. If they did not record that means they did not use it. For instance, the teacher needs to indicate that today I need to teach this topic if he/she says it that with something written in the tracker that in which date he/she done that no proof provided. So if I see when I collect them I find no dates recorded and so no reflection in button then I see they are using to some extent (EKU H).

The teachers they are using the curriculum tracker always because when I collect them everything is out to date even the reflection part they fill it. The only problem

is grade 12 because they have extra class in the morning and afternoon, so you find the teacher finishes the topic early then curriculum tracker (PHO H).

To some extent because the teachers they are not using the curriculum tracker only they are using with the learners plans they got from 1+9 workshop and they do not complete the dates in the curriculum tracker (KWABA H).

To some extent because teachers they do not complete the curriculum tracker especial the reflection part (TISA H).

Based on the HODs' responses captured above, it looks as if teachers were still not using the curriculum tracker the way it was supposed to be used in schools.

The HODs seemed very happy about the HOD tool because it created professional conversations between HODs and teachers. They indicated that the tool developed them as heads of departments and teachers. Further, HODs pointed out that they were growing in their work as professionals and the processes of teaching and learning were taking place and they were able to finish the curriculum in each term. The other question that the researcher posed to the HODs was: Do you feel that the HOD tool assists you to have professional and supportive conversations with teachers? Some HODs said:

Absolutely, they assist us in professional and supportive conversations and we are having a respectful conversation based on concrete evidence about what had happened in the process of teaching and learning. The teachers they confidently reflect on his/her own experience in class and that forms the basis of the professional conversation (PHO H).

It has helped us and the new teachers to do better and even us to manage the curriculum coverage better. The curriculum coverage has improved. The tool also provides us with the methods on how to deliver the content in the classrooms (ZIPHO H).

Very helpful. The tool assisting me as the HOD a lot as everything is recorded. I am using the tool every day. It is now to track the work of teachers if they do finish the curriculum or not in the classroom (TISA H).

Based on the responses from the HODs, the curriculum tool assists them to grow in their work as department heads.

5. 3 Enabling factors in using the curriculum tracker

This chapter discusses the themes that emerged about the enabling factors that enhance teachers' usage of the curriculum tracker and HODs' usage of the curriculum tools to engage in professional conversations about curriculum coverage with teachers. Overall, it was found that not all teachers used the curriculum tracker and not all HODs used the curriculum tools to engage in professional conversations as required with teachers. Secondly, in many instances even those who indicated that they were using the curriculum tracker or curriculum tools had no evidence to support the claim. For example, there were no curriculum trackers to verify if these were being used and there were no activities in the learner's book to show that since the curriculum tracker was used routinely, activities in the learner's book complement what is indicated in the curriculum tracker. In the case of HODs, there generally was no evidence to show that meetings were being held with teachers even when curriculum trackers were signed, or minutes to show that issues of curriculum coverage were being discussed with teachers or evidence of one-on-one meetings. However, based on what transpired during the interviews, and in a few instances from the surveys, there are some enabling factors that teachers and HOD alluded to. These are discussed below.

5.3.1 Curriculum tracker is simple to use and straight forward

Most teachers pointed out that one of the enabling factors was that using the curriculum tracker was simple and straight forward. This made it easy for them to follow the topics to cover every day and activities that they need to do. Also, the provision of summative tasks made teachers find the tracker to be of value to them, as teachers ST from ECU commented that; *"it is not easy to think about investigations that can use with the learners and the curriculum tracker provides us with that"*. The issue of the provision of assessment tasks was commended by all

teachers. Further, providing papers aligning with the department of education standard was found by teachers to be of help.

In addition, the teachers indicated that what made the tracker even easier to use was the breaking down of the topics to be covered, which made it easy for them to plan. They indicated that unlike the annual teaching plan that provided themes for the week, the curriculum tracker provided an exact topic for each day.

5.3.2 Curriculum tracker aligns with the CAPS and guides the pace

All teachers agreed that the curriculum tracker aligned well with CAPS. Further, some teachers, mostly Science teachers, indicated that the pace of the curriculum tracker is flexible and allow for revision time. Although mathematics teachers acknowledged the inclusion of revision time, they commented that such time was used to complete the curriculum because they found that the pace of the tracker was suitable for an ideal learner and not the type of learners they taught.

5.3.3 Curriculum tracker tracks other resources

All teachers indicated that they used the tracker in order to find other books to use since as teachers they needed to use more than one book. Therefore, the fact that the curriculum tracker tracks other books made them to use it since it reduced the time spent checking all books for additional information to supplement the information in the text book used by learners. Furthermore, teachers raised the issue that the tracker linked with lesson plans provided in the other workshops, such as the 1+9. This alignment helped with the planning for lessons.

5.3.4 Curriculum tracker and curriculum tools open room for communication

HODs commented that as they are either Science or Mathematics specialists but had to manage the curriculum in both subjects, and the tools helped them know what to look for and what to ask for from teachers without fear of not being a subject specialist. EKH commented:

One –on-one meetings were not happening because when you call a teacher it assumed you want to reprimand them now teachers know that one-on-one meeting are just for us to talk about curriculum coverage then it lessens the tension.

However, he highlighted that Science teachers were the ones who are more comfortable with one-on-one meetings as compared to mathematics teachers. Even the evidence provided showed that there had been meetings with Science teachers but not much with Mathematics teachers. However, the HODs were not prepared to engage in the reasons for such.

5.4 Conclusion

In this chapter the aim was to explore the enabling factors associated with the usage of the curriculum coverage among Mathematics and Science teachers and usage of curriculum tools by HODs to engage in professional conversation with teachers about curriculum coverage. The next chapter presents the challenges that teachers and HODs encounter in the usage of the curriculum tracker. The findings from the secondary data showed that some teachers did use the curriculum tracker routinely but did not explore the usage of the tools by HODs. Although the findings showed that some teachers did use the tracker, the reasons were not explored and in many cases there was no evidence to support the claims that the tracker was being used. Although in the interviews most teachers could not provide evidence to support their claim of using the curriculum tracker and the HODs of using the curriculum tools, they did provide reasons as to why they used it. It might seem that there are a few reasons the teachers used the curriculum tracker, but it is being rolled over in other districts, such that these factors can serve as the basis to build on the momentum to motivate the usage of the curriculum tracker.

The Whole teacher approach framing this study emphasises three elements, that is, knowledge, practice and attitude. The findings in this chapter seem to suggest that teachers' attitudes had more to do with the extent to which they used the curriculum tracker. Further, the teachers commented on the lack of knowledge of designing different types of assessment and found the curriculum tracker to be useful in that respect, thus suggesting that if teachers find something to be of value in expanding their knowledge then they were more likely to use. In terms of practice, the comment about helping with planning suggests that teachers are more likely to use innovations if it would lessen pressures of professional practise.

The next chapter explores the challenges associated with curriculum coverage as it was evident that some teachers do not use the curriculum tracker routinely and some HODs do not use the curriculum tools and, to some extent, some do not use it at all. The next chapter further explores the effectiveness of the curriculum tracker in improving curriculum coverage.

CHAPTER SIX

CHALLENGES ASSOCIATED WITH CURRICULUM TRACKER USAGE

6.1 Introduction

The previous chapter presented the results of the study under the theme enabling factors of curriculum usage by mathematics and Physical Science teachers in Pinetown and King Cetshwayo districts. Furthermore, results about HODs' usage of the curriculum tools to manage curriculum and engage in professional conversations with teachers were presented. The curriculum tracker was piloted in schools by PILO, working together with the department of education, in 2015 in the two districts with the aim of assisting teachers to cover the curriculum. While chapter five explored the enabling factors leading to the usage of the curriculum and other curriculum tools, data revealed that there were various challenges faced by both HODs and teachers in using the tools. This chapter, therefore, presents results revealing the challenges faced by both teachers and HODs in using the tool for the purpose intended. Although there were trainings taking place prior to the implementation of the tools in all the schools in the districts, it would seem the trainings did not help to alleviate all the challenges. Providing information to all education stakeholders about enabling factors and challenges would be of significance in the roll out of the programmes to other districts as the enabling factors can be escalated and challenges be overcome. Findings from surveys, questionnaires and interviews conducted with HODs and teachers are presented below.

6.2 Findings associated with Challenges

The curriculum tracker intervention was piloted in the two districts sampled for this study between 2015 and 2017. In 2015 and 2016, surveys and interviews were conducted with various stakeholders in the schools to explore the implementation process. These included mostly principals and HODs. In 2017 interviews were conducted by the researcher and other PILO coaches and teachers, particularly to explore teachers' usage of the curriculum tracker. Data from different data sources since 2015 was analysed to explore challenges discovered.

6.2.1 Evaluation of the schools in 2016

Of the six schools that participated in this study, four evaluated themselves about the extent of tracker usage in 2016. During the process of the school evaluation, either the principal, HOD or a teacher assumed a code, that is, Green, Amber or Red. When a school coded itself green that meant it had minimal or no challenges at all in using the curriculum tracker in the school. When the school rated itself amber that meant the school did have substantial challenges. Lastly, if the school rated itself red, that school did not use the curriculum tracker because they had debilitating challenges in using the curriculum tracker. Based on the self-evaluation in 2016, three schools coded themselves amber on the use of the curriculum tracker by teachers; thus, suggesting that although they used the curriculum tracker, they did not use it fully. There were challenges hindering their efforts to use the tracker. One school (PHO) evaluated itself green, suggesting that they did not have challenges with the use of the curriculum tracker. Therefore, no further exploration of data from PHO self-evaluation survey is done.

In the extracts below, questions 4-7 had to do with the usage of the curriculum tracker and other curriculum tools. It appears from the extract that while at ZIPHO, TISA and ECU were doing well in other aspects, they had experienced challenges with the usage of the curriculum tracker and other curriculum tools.

		1. The principal has her/his own Curriculum Management Supervision Plan	2. The principal is monitoring curriculum coverage according to the plan	3. Each HoD has her/his own curriculum management supervision plan	4. Each HoD is using a tool to track her/his teachers' curriculum coverage	5. Teachers are using the Planner-Trackers consistently (in subjects that have them)	6. There are one-on-one meetings between the principal & HoDs	7. There are subject/phase meetings of the HoD & her/his teachers weekly	8. There is an Annual Assessment Programme for all grades and subjects in the school
PRIMARY OR SECONDARY OR COMBINED	HOME LANGUAGE	1	2	3	4	5	6	7	8
SECONDARY	Isizulu	green	green	green	amber	amber	amber	amber	green

Figure 6.1: Extract from ZIPHO

1. The principal has her/his own Curriculum Management Supervision Plan	2. The principal is monitoring curriculum coverage according to the plan	3. Each HoD has her/his own curriculum management supervision plan	4. Each HoD is using a tool to track her/his teachers' curriculum coverage	5. Teachers are using the Planner-Trackers consistently (in subjects that have them)	6. There are one-on-one meetings between the principal & HoDs	7. There are subject/phase meetings of the HOD & her/his teachers weekly	8. There is an Annual Assessment Programme for all grades and subjects in the school
1	2	3	4	5	6	7	8
Amber	red	amber	amber	amber	amber	green	green

Figure 6.2: Extract from TISA

1. The principal has her/his own Curriculum Management Supervision Plan	2. The principal is monitoring curriculum coverage according to the plan	3. Each HoD has her/his own curriculum management supervision plan	4. Each HoD is using a tool to track her/his teachers' curriculum coverage	5. Teachers are using the Planner-Trackers consistently (in subjects that have them)	6. There are one-on-one meetings between the principal & HoDs	7. There are subject/phase meetings of the HOD & her/his teachers weekly	8. There is an Annual Assessment Programme for all grades and subjects in the school
1	2	3	4	5	6	7	8
Amber	Amber	Green	Amber	Amber	Amber	Amber	Amber

Figure 6.3: Extract from ECU

Although the curriculum tracker and other curriculum tools were used by the teachers and HODs in 2015, when the evaluation was done in 2016 the schools indicated that it was not every time that they were using the curriculum tracker. HOD was asked if he using the tracker to monitor the coverage of the curriculum by the teachers, only one school out of the four schools that were evaluated coded itself green to indicate that the HOD was always using the curriculum tool to track teachers' curriculum coverage. The school was PHO. At PHO the HOD indicated that while they faced challenges, they always used the curriculum tracker. Three schools (ZIPHO, ECU and TISA) colour coded themselves amber, meaning that the HODs were using the curriculum tool to track curriculum coverage for teachers but only sometimes.

The HOD from ECU reported that sometimes they used the curriculum tool because it assisted them to check teachers' work; however, the problem in the schools affected them so they often just went to classes to ask for learners' exercises. The teachers were also asked to colour code themselves if they were using the curriculum tracker consistently in their subject. Out of four schools only one school (PHO) colour code itself green. The rest of the schools colour coded themselves amber, indicating that the teachers were not using the curriculum tracker consistently.

6.2.1.1 Challenges that hindered teachers' and HODs' usage of curriculum tools

In this section, the focus was on presenting challenges that hindered the full utilisation of the curriculum tracker by teachers and curriculum tools by HODs. The schools rated themselves amber, suggesting that there were challenges encountered.

9. The school is on track with the assessment programme	10. The SMT knows our school's results for last year and has set targets for this year	11. Subject/phase committee meetings are held once a term to discuss learner performance	12. Our composite school timetable is in place and it is CAPS compliant	13. Our SMT meetings are being held weekly	14. The SGB meets regularly with a written schedule for 4 meetings per year	15. The school has a budget (approved by the SGB)	16. Parents' meetings are being held every term	17. At parents meetings Learner performance and behaviour is discussed	18. The SMT actively maintains / improves relationships with the Community	19. The school has up-to-date class registers (and period registers, if appropriate)	20. Teachers and learners are consistently on time in class	21. The school makes plans to improve (or maintain) learner attendance	22. The school communicates with parents of absent learners
9	10	11	12	13	14	15	16	17	18	19	20	21	22
Amber	Amber	Green	Green	Green	Green	Green	Green	Green	Amber	Green	Amber	Amber	Amber

Figure 6.4: Extract from ECU

9. The school is on track with the assessment programme	10. The SMT knows our school's results for last year and has set targets for this year	11. Subject/phase committee meetings are held once a term to discuss learner performance	12. Our composite school timetable is in place and it is CAPS compliant	13. Our SMT meetings are being held weekly	14. The SGB meets regularly with a written schedule for 4 meetings per year	15. The school has a budget (approved by the SGB)	16. Parents' meetings are being held every term	17. At parents meetings Learner performance and behaviour is discussed	18. The SMT actively maintains / improves relationships with the Community	19. The school has up-to-date class registers (and period registers, if appropriate)	20. Teachers and learners are consistently on time in class	21. The school makes plans to improve (or maintain) learner attendance	22. The school communicates with parents of absent learners
9	10	11	12	13	14	15	16	17	18	19	20	21	22
green	green	green	green	amber	amber	green	amber	green	green	amber	green	amber	amber

Figure 6.5: Extract from ZIPHO

9. The school is on track with the assessment programme	10. The SMT knows our school's results for last year and has set targets for this year	11. Subject/phase committee meetings are held once a term to discuss learner performance	12. Our composite school timetable is in place and it is CAPS compliant	13. Our SMT meetings are being held weekly	14. The SGB meets regularly with a written schedule for 4 meetings per year	15. The school has a budget (approved by the SGB)	16. Parents' meetings are being held every term	17. At parents meetings Learner performance and behaviour is discussed	18. The SMT actively maintains / improves relationships with the Community	19. The school has up-to-date class registers (and period registers, if appropriate)	20. Teachers and learners are consistently on time in class	21. The school makes plans to improve (or maintain) learner attendance	22. The school communicates with parents of absent learners
9	10	11	12	13	14	15	16	17	18	19	20	21	22
green	amber	amber	green	green	green	green	green	green	amber	green	amber	amber	amber

Figure 6.6: Extract from TISA

The evidence above clearly indicates that the teachers faced different challenges in using the curriculum tracker. Out of the four schools, only one school (PHO) reported that it did not have any challenges in the usage of the curriculum tracker in 2016. The other schools (EKU, TISA and ZIPHO) cited various challenges. For example, teachers from TISA indicated that in 2015 and 2016 it was their first time using the curriculum tracker, so they had a lot of problems at the initial implementing stages because of lack of training. ZIPHO indicated that at first the teachers did not accept the tracker because they did not understand it, and because of the lack of support from the CV and the department of education. EKU stated that the school lacked in curriculum management, and they could only improve if they got training about the usage of the curriculum tracker. Further, the data indicated that lack of resources in the school resulted in the lack of curriculum coverage. One wonders, however, if the schools did not get training because there was no training offered or because they did not attend training.

6.2.2 Curriculum coverage in 2016 and challenges: data from school survey August 2016

The self - evaluation discussed above was conducted early 2016 to explore what had taken place in the first year of the implementation of the curriculum tracker. The second survey was conducted in August 2016. Based on the August survey of 2016 (AS-2016), teachers were asked to fill the survey and indicate how much of the curriculum they covered. However, in the self-evaluation the schools were asked to evaluate themselves according to green, amber and red to indicate their challenges in school with the usage of curriculum tracker. All the six

schools that participated in my study had participated in the August survey, unlike in the self-evaluation where only four participated. In order to explore the usage of the curriculum tracker, teachers or an HOD had to complete a questionnaire. Extracts below show a sample of questionnaires and responses from the six schools.

	100%	75% - 99%	50% - 74%	25% - 49%	Less than 25%
a) How much of the curriculum of 2016 do you think you have covered?		X			
b) What are the 3 biggest challenges you have faced this year in getting through the curriculum? No challenges so far					

	100%	75% - 99%	50% - 74%	25% - 49%	Less than 25%
c) How much of the curriculum of 2016 do you think you have covered?		X			
What are the 3 biggest challenges you have faced this year in getting through the curriculum? <ul style="list-style-type: none"> Local strikes impact on curriculum coverage. Our absent educators and not getting the right locum to fill in. The absenteeism of learners also impacts greatly. 					

Figure 6.7: Response from KWABA

KWABA did not participate in the self-evaluation. In the extract above, the school indicated they had no challenges, although they scored themselves between 75%-99% in terms of curriculum coverage. The question that comes to mind is; if there are no challenges, why then have they not covered 100% of the curriculum?

	100%	75% - 99%	50% - 74%	25% - 49%	Less than 25%
d) How much of the curriculum of 2016 do you think you have covered?		X			
e) What are the 3 biggest challenges you have faced this year in getting through the curriculum? <ul style="list-style-type: none"> • Local strikes impact on curriculum coverage. • Our absent educators and not getting the right locum to fill in. • The absenteeism of learners also impacts greatly. 					
f) Has the tracker helped you plan and monitor your coverage of the curriculum? Please explain your answer. <p>Yes it helps us see where we are lacking and what to focus on if we do not finish in the previous Term.</p>					

Figure 6.8: Extract from PHO

In the self-evaluation survey, PHO rated itself green to suggest that its teachers' use of the curriculum tracker was efficient. Although it would seem the teachers were using the curriculum tracker efficiently, there was evidence that this had not translated to curriculum coverage. The reasons cited that affected curriculum coverage were community strikes, and educators and learners' absenteeism. The two factors had direct impact on the usage of the curriculum, which, to some extent, might contradict the green rating. If teachers were absent, then who used the curriculum tracker? Learner absenteeism also has a direct impact on the teachers' usage of the curriculum tracker because if more learners were absent that would mean teachers kept repeating previous content and lost track of the curriculum.

	100%	75% - 99%	50% - 74%	25% - 49%	Less than 25%
a) How much of the curriculum of 2016 do you think you have covered?			✓		
b) What are the 3 biggest challenges you have faced this year in getting through the curriculum?					
<ul style="list-style-type: none"> - learners take longer time than expected to master concepts - learners' attitude towards Maths is a stumbling block. 					

Figure 6.9: Extract from ISIZ

Like KWABA, ISIZ did not take part in the self-evaluation survey. From the extract above it appears that there are challenges with curriculum coverage. Although one cannot say this translates to curriculum tracker usage by teachers, one wonders how the curriculum tracker has assisted in the curriculum coverage, which was the ultimate goal in introducing the curriculum tracker in schools. The reasons cited above suggest that there is a possibility that the curriculum tracker was not utilised as it was cited that learners took longer to master concepts. This could translate to teachers not tracking the topics daily since it would mean one topic intended for one lesson might end up being taught over three days.

	100%	75% - 99%	50% - 74%	25% - 49%	Less than 25%
a) How much of the curriculum of 2016 do you think you have covered?		✓			
b) What are the 3 biggest challenges you have faced this year in getting through the curriculum?					
<ul style="list-style-type: none"> - OVERCROWDING - LACK OF RESOURCES BY CALCULATORS 					

Figure 6.10: Extract from ECU

The reasons cited by ECU that impact negatively on curriculum coverage are shortage of resources, both material or human resources, which would not directly impact the use of curriculum trackers by teachers and curriculum tools by HODs. However, what is noticeable is that there is a relationship between schools that rated themselves amber, suggesting they have challenges with curriculum tracker usage, and the extent of curriculum coverage. This

suggests that challenges associated with curriculum usage might have direct or indirect impact in the curriculum coverage or vice versa.

	100%	75% - 99%	50% - 74%	25% - 49%	Less than 25%
a) How much of the curriculum of 2016 do you think you have covered?			✓		
b) What are the 3 biggest challenges you have faced this year in getting through the curriculum?					
<ul style="list-style-type: none"> - Shortage of LTM - learners do not have books. - Learner participation way too low. Demotivated. 					

Figure 6.11: Extract from TISA

Similarly, at Tisa, just like at ISIZ, there was quite low curriculum coverage, and the reasons cited were shortage of resources and lack of motivation among learners. However, it is not clear how the lack of motivation impacted negatively on curriculum coverage. It could also be noticed that the reasons cited exclude teachers and rather focuses on other factors. As per the framework of the study, it appears that teachers' attitudes are more inclined towards identifying problems outside their scope.

	100%	75% - 99%	50% - 74%	25% - 49%	Less than 25%
a) How much of the curriculum of 2016 do you think you have covered?		✓			
b) What are the 3 biggest challenges you have faced this year in getting through the curriculum?					
<ul style="list-style-type: none"> - learners are struggling with content. - Number of days away from school (workshop 149) - Moderation → (also teaches Gr 11) 					

Figure 6.12: Extract from ZIPHO

The reasons cited by ZIPHO have a direct impact on curriculum usage. Since teachers spent a lot of days away in workshops, it means it would be difficult to keep track of curriculum coverage. Instead, it would be teaching towards examination to ensure that learning outcomes

have been achieved. Secondly, if learners struggle with the content, the suggestion is that teachers might end up skipping other content.

Based on the extract above, one can conclude that the teachers were using the curriculum tracker but there are various challenges that hinder the effective usage of the curriculum tracker. There is also evidence that whether schools are using it effectively or not, in all the school's teachers are still struggling to cover the curriculum. This is contradictory to findings by Mkhwanazi et al. (2018) that there is somehow a relationship between the usage of the curriculum tracker and curriculum coverage. In these six schools, it could not be concluded that way, because even in schools like PHO that indicated that they were using the curriculum tracker routinely there was evidence that they struggled to cover the curriculum. The reasons for this lack of correlation between curriculum tracker usage and curriculum coverage could be that most of the cited reasons by the schools are factors outside school control. For example, community strikes impacting on the school attendance, workshops conducted during teaching time, and lack of human resources, which is an issue that need to be addressed by the Department of Education.

6.2.3 Data from the interviews in 2017 /2018: Teacher Challenges with using curriculum tracker

In this section, data collected by means of interviews between 2017 and 2018 is presented. The aim was to further explore the extent to which teachers used the curriculum tracker, and to observe if there were any improvement in the challenges raised in 2015 and 2016. The analysis of data from interviews led to emergent themes that seem to cut across all the schools. For example, the research found that schools encountered different challenges in using the curriculum tracker in the schools. Even the schools using the CT routine had challenges. While the schools faced different challenges, they managed to rise above all challenges. The major challenge the schools were facing in relation to the curriculum tracker was the lack knowledge of using the curriculum tracker among teachers as well as the attitude toward the curriculum tracker by the teachers, which results in teachers not using the curriculum tracker regularly in the schools. In the section to follow, more details that emanate from the data about the challenges in the usage of the curriculum tracker and curriculum tools by both teachers and HODs are discussed.

6.2.3.1 HOD challenges in the usage of the curriculum tool and management of curriculum tracker

The above discussion pointed out the different challenges faced by the teachers in the usage of the curriculum tracker in schools. The introduction of the curriculum tracker was premised on the development of a supporting environment than that of evaluation and monitoring. Thus, it encourages HODs to support teachers in managing and tracking the curriculum through having professional conversations. To guide HODs on how to manage these professional conversations, they were provided with curriculum tools to use when meeting with teachers and these guide them on what to focus on in their meetings. In order to explore the usage of the tools, HODs were asked to comment on how they worked with teachers to track and manage the curriculum. According to the HODs, the curriculum tool-assisted is an ideal tool that would assist them to manage the curriculum tracker and to have a professional conversation with teachers. Although HODs considered curriculum tools to be ideal, they noted that there were challenges in using the curriculum tools effectively. The comments raised by the HODs suggest that the tool can be effectively used when the curriculum tracker has been completed in order for them to see how much of the curriculum has been covered. However, since some teachers did not use the curriculum tracker, HODs found it difficult to understand the extent to which the curriculum had been covered in order to work with teachers in planning catch up time.

One of the guiding questions read: Of the mathematics and sciences teachers you supervised, how many reported that they had completed all of the CAPS in 2017? Some of the comments that were raised in relation to this during the interviews are shown below:

Othisha abayigcwalisi njalo icurriculum tracker. (meaning teachers are not consistent with the filling of the curriculum tracker) (EKU H).

The teachers manage to finish the curriculum in term 1,2 and 3. However, he did not finish the curriculum in term four because of the space in our school. We use all the classes for matric examination and also the teachers do no fill the curriculum tracker (ISIZ H).

Although the teachers completed the topics I saw that topics were not done properly and the curriculum tracker was not completed (KWABA H).

Based on the above responses, it seems that the professional conversation about curriculum coverage has not been taking place since HODs face challenges in trying to establish the extent to which the curriculum has been covered. In the analysis of the tools it was observed that one-on-one meetings were not taking place and, where group meetings take place, the discussion is general rather than being with specific individuals about curriculum coverage as indicated in the excerpts below.

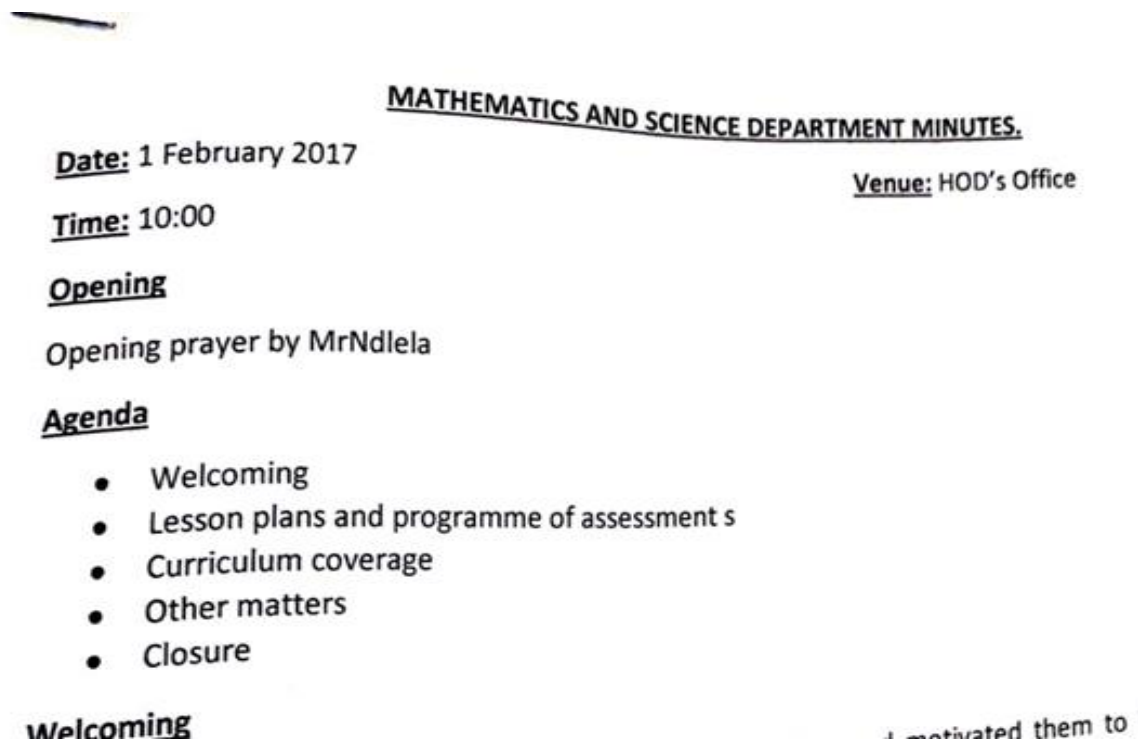


Figure 6.13: Extract from KWABA

Date: 22 February 2017

MATHEMATICS AND SCIENCE DEPARTMENT MINUTES.

Time: 10:00

Venue: DP's Office

Opening

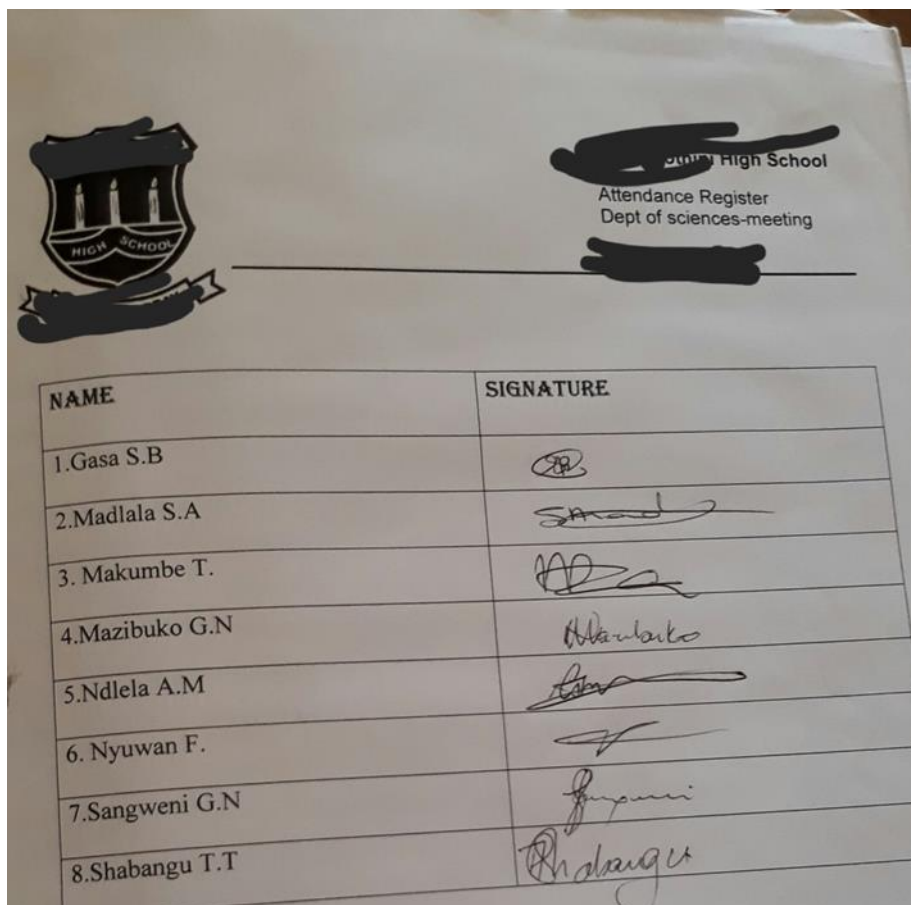
Opening prayer by MrNdlela

Agenda

- Class visits
- CASS
- Curriculum coverage
- Closure

Class visits

Figure 6.14: meeting held 22 February 2017 in KWABA



The image shows a document with a school crest on the left and a title on the right. The crest features three lit candles and the words 'HIGH SCHOOL'. The title reads 'KWABA High School', 'Attendance Register', and 'Dept of sciences-meeting'. Below this is a table with two columns: 'NAME' and 'SIGNATURE'. The table contains eight rows of names and their corresponding signatures.

NAME	SIGNATURE
1. Gasa S.B	[Signature]
2. Madlala S.A	[Signature]
3. Makumbe T.	[Signature]
4. Mazibuko G.N	[Signature]
5. Ndlela A.M	[Signature]
6. Nyuwan F.	[Signature]
7. Sangweni G.N	[Signature]
8. Shabangu T.T	[Signature]

Figure 6.15: Extract of the attendance register from a meeting at KWABA

As evident in the extracts above, it is noticeable that the HOD does not have one-on-one meetings with the teachers but he does hold meetings every week with all the teachers in the department. The participants highlighted during the interview that the meetings used to be held at least once per term but after the *Jika imfundo* project was introduced, the HOD started holding these meetings every week. The excerpts are shows that these meetings were held every week as the dates of the minutes show that meetings were held every Wednesdays.

6.3 Challenges encountered by Teachers and HODs: lessons from interviews

Six schools participated in the study, and one teacher for Mathematics and one teacher for Science were interviewed per school to give a total of 12 teacher participants. Four HODs were interviewed because in two schools' teachers served both as a teacher and HOD. This gives a total of sixteen participants.

All twelve teachers and four HODs pointed out different challenges they were facing in the usage of the curriculum tracker and other curriculum tools. Teachers raised the issue of contradiction between topics covered in the Annual Teaching Plan (ATP) and curriculum tracker. Since the structure of examination is derived from the ATP, they believed it was best for them to use the ATP instead of the curriculum tracker. This suggests that there is need for synergy between all the documents in order for teachers not to be confused. Another concern raised by the teachers was the issue of pace. They argued that the curriculum tracker did not cater for slow learners in terms of pace, as having topics specified per day means that each day there was need to move to a new topic, but measures are provided to cater for situations when learners have not understood the topic meant to be taught in a particular day. Their argument is that it caters for ideal learners and is too fast for some learners. This was captured in the interview with teachers. The researcher asked: What are the challenges you are experiencing with using the curriculum tracker? Below are some of the responses that the participants forwarded:

Leaners are my only challenge because they do not have a mathematics background. They cannot even calculate the fractions so that affect the usage of the

curriculum tracker because states the time you need to use in class for a particular topic (ISIZ MT).

One of the challenges I have is learners they are too slow. You will find that the exercise in my learners will take two or three days and in the tracker it only one day. For instance, right now we doing decimal in the class. the curriculum tracker says we must revise the addiction, subtraction, multiplication, and division. When you get to learners is not a revision you need to teach again. Then you get behind in the tracker (ZIPHO MT).

The pace of the curriculum tracker is the problem to learners but not that too much. You will find that the department dates we used in the tracker and exam dates are before we finish the curriculum according to the tracker. Sometimes you plan that you will teach from here to here but you can see that you are walking alone learners do not understand so you need to go back and find me behind from the curriculum track so the pace is fast. However, it helps to work for extra hours (PHO ST).

Mmm the curriculum tracker says on day one you must solve x for example and on day two do something else. So I think it moving very fast for our learners one lesson maybe is equal to two lessons (KWABA ST).

In the curriculum tracker there is no room for adjustment, for instance, one-day topic in the curriculum tracker but for learners, it can possibly take two to three days to understand it. It does not cater enough time for learners' ability to understand the topic (EKU MT).

The pace of the curriculum tracker is the problem in our learners. Our learners are too slow in mathematics and science. Sometimes you find that the days for teaching and learning in the curriculum tracker and the examination dates from the

department of education are contradicting. The examination dates are before you finish the curriculum (TISA ST).

Six teachers raised concern with the pace of the curriculum tracker. The challenge they have is the learners versus the pace of the curriculum tracker. Teachers indicated that the pace in the curriculum tracker was good because it helped them to finish the curriculum. However, it did not help the learners because they were too slow in grabbing the content in mathematics and science.

Out of the twelve teachers that were interviewed, seven indicated that the curriculum tracker did not bring any change as far as their concern about covering the set curriculum for a year. Teachers complained that the ATP was too packed. They also indicated that there were no differences between the curriculum tracker and the ATP. However, they indicated that the curriculum tracker was easier to use than the ATP because it broke down all the topics. All the same, the teachers felt that the curriculum tracker was still too packed, and a lot needed to be taught in mathematics and science.

The next question the researcher asked was: In what way is the curriculum tracker different or similar to the Annual Teaching Practice (ATP) that you have been using in the past? The following are some of the responses that came from the participants:

I think it is the same thing they are no different in the topics all the topics you find in the ATP they are still there in the curriculum tracker. It is still too much to teach in a short period of time. The only difference that I noticed is the curriculum tracker breakdown each topic while the ATP and CAPS only give the topic that you need to teach in class (ISIZ ST).

There is no much difference between the curriculum tracker and the ATP it is still overloaded. But the difference is that the curriculum tracker says that this day to do this unit. However, the ATP says from this day to this day do this topic. But the

curriculum tracker breaks down the topics for that day and for day two and so on. It is specific; however, it is still too packed (EKU MT).

In science curriculum tracker there is no much different because all the topics are there. However, the curriculum tracker is clearer than the ATP (KWABA ST).

The above responses indicate that teachers still worry about the curriculum tracker being too packed. Teachers indicate that there is no difference between the ATP and the curriculum tracker in terms of the curriculum that needs to be covered in mathematics and science.

The teachers pointed out that one of the challenges they encountered was the late arrival of the curriculum tracker in the schools. All teachers indicated that the curriculum tracker is arriving very late in their schools. This affects their work, and also results in the inconsistency of usage of the curriculum tracker by teachers. The question posed was: what are the challenges you are facing in the school that result in the inconsistency of curriculum usage by teachers? Below are some responses:

Mmm you see curriculum ifika late kakhulu lapha esikole othisha sebeqalile ufufundisa especially in matric one chapter or two asuke esephelile ngoba bavula early. Meaning the curriculum tracker is arriving very late in school. Arrive when the teachers already started teaching, especially in matric one chapter or two chapters did because they are opening very early (EKU MT).

Sometimes the curriculum tracker arrived very late in our school but the teachers they do their best to use it and update them even if they come late (PHO MT).

I think one of the challenges that result in the inconsistency in the usage of the curriculum tracker. Last year (2017) curriculum tracker arrived very late in school. Teachers were already started teaching and even tested learners (KWABA ST).

Based on the responses above, the late delivery of the curriculum tracker was a challenge that contributed to the inconsistency of its usage by the teachers. They further report that they felt that paperwork had increased because they then needed to go back and fill in the curriculum tracker.

Another challenge raised by the teachers was the issue of being overloaded with documents, without clear explanation of how to combine these documents. For example, they raised the issue that subject advisors emphasised that they must use ATP, which they find to be too much duplication and resulting in too much admin to complete both documents, let alone teaching using both. Teachers argued that when subject advisors visited them, they asked for the ATP and not the curriculum tracker. Therefore, they opted to use ATP as evident in the interview extract below:

I do not use the curriculum tracker every day because the department also gave us the daily lesson plans in a 1+9 intervention which also guide us in what to teach on a particular day and which activities to give to learners. For me which is more the same as the curriculum tracker (ISIZ MT).

I still have a challenge in figuring out whether I must use the tracker or these lesson plans from 1+9 as I had two things and I wasn't sure which one to use. This is more of the same thing in the 1+9 workshop they provide us with lesson plans and they have learner's activities and the curriculum trackers do (KWABA MT).

Since 2015 we used to attend workshops from the 1+9 workshop and those workshops they provide us with lesson plans on what to teach every day and everything is there the classwork, homework for learners. It also simplifies everything. So I still have a challenge on which one to use. However, they complement each other but the lesson plans had their own exercise and the tracker has its own exercises. That where I get confused which one I need to use (ZIPHO ST).

I do not want to lie sometimes I do not use the curriculum tracker because of It not in line with the ATP. I am using the ATP because the subject's advisors want ATP when they are coming to the school for a visit. Last year I had a bad experience when I was using the tracker. It said that in term two I had to cover trigonometry but the ATP said that trigonometry should be covered in term 3. As a result, I am using ATP most of the time (KWABA ST).

The problem with ATP and curriculum tracker is that sometimes they are confusing. you find that the topic that is needed to be done in term two in the ATP and the curriculum tracker needs to be done in term three. Therefore, sometimes I am using ATP because is the one that Subject advisors giving for examination (TISA MT).

I thought the curriculum tracker came to substitute the ATP but when we went to workshop subject advisor said we need to use it both. However, some of the topics from the ATP you would not find them in the curriculum tracker and some of the topics from curriculum tracker are not there in the ATP. So most of the time I am using ATP because it gives guidance for examination (ISIZ ST).

Based on the responses from the teachers excerpted above, it would seem that teachers are still finding it difficult to work with both the curriculum tracker and the ATP.

In addition to the above challenges, teachers further indicated that resources were still a very big issue in the schools. Learners still did not have enough books to study. They were still sharing, which affected ensuring that tasks were done exactly as suggested in the curriculum tracker. Further, they cited that the curriculum tracker did indicate when teachers need to supplement the activities in the book used. This means teachers need to do additional copies for learners for the additional activities or they have to give learners more home work to do. Therefore, if there were shortages of resources it became difficult to complete the specified tasks, which led to abandonment of the curriculum tracker by some teachers.

The researcher also asked the question: what are the difficulties you are facing in terms of resources? Some participants indicated as follows:

Learners do not have books. Even now as we speak we still write activities on the board and homework which is time-consuming (EKU ST).

Resources still a challenge when you want to give learners homework. Sometimes we are trying to photocopy for them but not every day because sometimes machines are not working. Therefore, we cannot give them enough homework because they do not have books (TISA ST).

Resources still a challenge in this school they do not have enough books. Sometimes when you want to give learners homework we do copies for them but not every day. We cannot be able to give them enough home because they do have a book (ZIPHO MT).

As science teachers we need resources to do experiments in our subject. Therefore, we have challenges; we do not have enough resources to do experiments. As a result, sometimes we group them and a lot of times is wasted (PHO ST).

It became evident in the responses above that the lack of resources was a challenge. However, when asked what measures they tried to put in place to minimise the challenges of shortage of resources it seems that no attempts had been made. They opted to use the curriculum tracker as a referral document rather than a document to use for lesson planning purposes.

Moreover, teachers raised the issue of lack of training and lack of orientation when they joined the school because those who would have attended trainings would have either been promoted to senior positions in other schools or moved to different schools. Some would have retired.

These sentiments were mainly raised by the teachers. The question they were responding to was: did you get any training about the usage of curriculum tracker? Some of the responses are excerpted below:

To tell you the truth when I came here in the school the HOD just gave me the curriculum tracker to use we never had any training about the usage of the curriculum tracker (ISIZ MT).

In the school it been long we do not have the HOD the teachers that are joining us they do not know nothing about the curriculum tracker no one trained them (ZIPHO MT).

Kunzima mfethu asikaze sinikezwe training ngokusebenzisa icurriculum tracker; uma ufika esikoleni bavele bakunikeze bathi zisebenzise ungenalo ulwazi ukuthi zisebenza kanjani. [It is hard we were just given the curriculum tracker to use in your subject, however we lack knowledge on how to use it] (TISA ST).

I can in the school last I did not get any training about the usage of the curriculum tracker. The HOD left and we had a new HOD from another district that there were not using the curriculum tracker so it hard for him to train us while he need some training about how to use the curriculum tracker (EKU ST).

The comments above are the evidence that teachers need training about the usage of the curriculum tracker, and when a new HOD joins the school they need to be trained on how to use the curriculum tracker so that the he/she will train the new teachers that are joining the school.

6.4 Discussion on common challenges teachers and HODs encountered in using the curriculum tracker and curriculum tools

This chapter discusses the challenges that teachers faced in the usage of the curriculum tracker in schools and HODs challenges in the usage of the curriculum tool to track teacher's curriculum coverage also engaging with teacher's professional conversation. Teachers and HODs mentioned different challenges encountered in schools in using the curriculum tracker and curriculum tool. After analysis of the findings, common challenges that teachers have were grouped and emerging themes were grouped together in line with key ideas of the whole teacher approach framework, that is, knowledge, attitude and practices.

6.4.1 Learners vs the pace of the curriculum tracker

All the teachers pointed out that the pace in the curriculum tracker did not accommodate all learners. It was only favourable to the high flyers, but the slow learners and average learners were not accommodated. For instance, mathematics teachers indicated that learners lacked mathematics content. As the MT from ISIZ said, *“learners they are lacking mathematics background. Every day you need to introduce a topic you have to start from the previous grade’s work”*. Therefore, the teachers felt that the pace was too fast for some learners.

6.4.2 Curriculum tracker arrives late in the schools

Teachers complained about the late arrival of the curriculum tracker in schools. They felt that this increased their paperwork. They had to go back and fill the tracker and reflect on the lessons they would have done a long time before. Therefore, teachers end up demotivated to use the curriculum tracker because of the paperwork that they need to go through. For example, MT from ISIZ pointed out that *“The issue of not filling the curriculum tracker completely it because it arrives late in the school made around February”*.

6.4.3 Curriculum tracker still too packed

All the teachers agreed that the curriculum tracker was too packed. They indicated that there was no difference between the ATP and curriculum tracker. They complained about the ATP being packed. Teachers also indicated that learners could not grab everything in a short period of time. Therefore, they still believed that the curriculum tracker was too packed. However, the

teachers indicated that the curriculum tracker was easy to use because in it the topics are broken down, but a lot needed to be done in the class in a short time.

6.5 Conclusion

In this chapter, the aim was to explore the challenges associated with the usage of curriculum tracker by mathematics and science teachers and the usage of curriculum tools by HODs to engage in a professional conversation with teachers about curriculum coverage. The next chapter conclude the study by discussing findings, outlining recommendations and summarising the study.

CHAPTER SEVEN:

LIMITATION AND RECOMMENDATIONS OF THE STUDY

7.1 Introduction

The preceding chapter engaged in a discussion of the findings of this study on the usage of curriculum tracker by secondary (9, 10 & 11) mathematics and science teachers in Pinetown and King Cetshwayo districts. This chapter seeks to confirm if the critical questions guiding this study have been answered as well as establishing if the research aim has been accomplished. The chapter mainly concentrates on articulating the key conclusions drawn from the study as well as the recommendations anchored in the studies reviewed, and the observed data presented and analysed in chapters five and six. Chapter five presented findings on the enabling factors with respect to the usage of the curriculum tracker and curriculum tools. Chapter six, on the other hand, presented findings on the challenges encountered by both teachers and HODs in using the curriculum tracker and curriculum tools.

The study was qualitative and was guided by the interpretivist paradigm. The interpretivist paradigm was selected because the researcher sought an understanding of the usage of the curriculum tracker by secondary (9, 10 & 11) mathematics and science teachers. A case study research design involving six schools in Pinetown and Cetshwayo districts was adopted by the researcher. Data was collected from twelve teachers of Mathematics and Physical Science and four HODs drawn from six schools in Pinetown and King Cetshwayo districts. The data was generated utilizing semi-structured interviews with the participants. The schools selected do not represent the population of all the schools that participated in the piloted project but were drawn from the pool of the schools that participated and from each quintile as articulated in the methodology chapter. Due to the inability to interview all the teachers in Pinetown and Cetshwayo districts, the researcher used purposive sampling to select participants for this study. The Whole teacher approach was used as the lens to understand the usage of the curriculum tracker and curriculum tools drawing the key principle of the framework, i.e. knowledge, attitude and practice. Data generated by the researcher was analysed using inductive analysis. Inductive analysis entailed identifying themes from the transcribed data of

conversations between the interviewer and interviewees. This chapter presents the conclusions and recommendations drawn from the findings and discussion presented in chapters five and 6

7.2 Conclusion drawn from the findings

Below I present the conclusion drawn from the finding of the study based on the two themes, namely; enabling factors, and challenges associated with curriculum tracker. The conclusions are drawn by linking findings with the theoretical framework; the whole teacher approach, with major focus on knowledge, attitude and practices. The analysis was done so that the researcher could provide answers to the following research questions:

- *Why have teachers used or not used the curriculum tracker to track curriculum coverage?*
- *How have the HODs used the curriculum tools to engage in professional conversations with teachers?*
- *What is the relationship between teachers' use of CT and curriculum coverage?*

7.2.1 Teacher knowledge of curriculum tracker

Teachers raised the issue of lack of training or orientation in the usage of the curriculum tracker. For instance, a teacher at KWABA commented that; "I first thought I had to use all the eight books indicated in the curriculum tracker and was not sure what to write on the sections that needed completing". A teacher at ZIPHO said; "when I arrived at the school I was only given a textbook, not a curriculum tracker. The HOD was promoted so I knew nothing about the curriculum tracker". These comments suggest that lack of knowledge impacts negatively on teachers implementing the curriculum tracker as it should. These further suggest that training needs to be directed to the implementers, and not to HODs to train teachers because if in a school there is one HOD for Mathematics and Physical Science and she or he leaves before training the teachers, teachers would be left with no expertise to use the tools. As pointed out by Mkhwanazi et al. (2018), the model *train the trainer* needs to be revisited if it is to be used at school level. The findings of this study suggest that the model does not work, indicating the need for the training to be directed to the implementers.

The issue of failing to find synergy between the curriculum tracker and other tools also points to the lack of teacher and HOD knowledge in using the tools. ATP provides weekly themes, 1+9 provides lesson plans, the curriculum tracker breaks the weekly themes to daily topics but does not provide lesson plan. Therefore, it is the teachers' responsibility to choose a relevant lesson plan to use with a particular topic instead of saying they prefer to use the 1+9 lesson plans instead of the curriculum tracker. These findings suggest that for the success of an intervention, implementers, in this case teachers, need to be equipped with knowledge and skills.

According to the findings of the study, the teachers still lack knowledge of the curriculum tracker. It was evident during the interviews that teachers showed that they do not know the importance of the curriculum tracker. Their responses indicate that teachers lack knowledge of how to use the curriculum tracker. Therefore, it can be argued that the teachers who participated in this study in Pinetown and Cetshwayo districts were not aware of the importance of the curriculum tracker. This lack of knowledge was revealed as contributory to the teachers' lack of acceptance of the curriculum tracker.

7.2.2 Teachers attitude towards the curriculum tracker

The findings of this study revealed that teachers' attitudes towards the curriculum trackers are negative because they feel it brings more paperwork for them. When unpacking their responses, it was observed that they did not fill in the reflection part in the curriculum tracker and the teachers complained that it brought too much of work. According to the teacher from ISIZ, "the curriculum tracker is good but there is lot of paperwork involved in it. We need to fill in dates every day and the reflecting part after every lesson you did". Also, a EKU teacher stated that; "I do not see any difference between ATP and curriculum tracker. The curriculum tracker adds a lot of paperwork we have as teachers". Teachers are failing to understand how to use the curriculum tracker and the ATP at the same time. That results in the negative attitude towards the curriculum tracker.

The issue of negative attitude of teachers towards the curriculum tracker affects the coverage of the curriculum in schools. Teachers indicated that the CT add on the paper work they already

have in their subjects. The reason for the negative attitude is lack of knowledge about the curriculum tracker, and teachers are not motivated because some of the teachers were never been trained to use the curriculum tracker. Furthermore, the reason that contributes to the negative attitude towards the curriculum tracker is lack of support from the department of education. The HOD from ECU indicated that they liked using the curriculum tracker in schools but the department of education and PILO organisers did not support them in the schools, and the subject advisors do not even talk about the curriculum tracker during workshops. As a result, the interest of the teachers in the curriculum tracker is very minimal.

7.2.3 Teacher practice of the curriculum tracker

The findings also indicate that the usage of the curriculum tracker was very poor in the schools. The findings also reveal that the implementation of curriculum tracker in schools is not taken into consideration. It is evident from the study that the curriculum tracker was used by the teachers and HODs in 2015. However, when the evaluation was done in 2016 the schools indicated that they were not using the curriculum tracker every time. Additionally, an HOD from ISIZ indicated that teachers were not following the instructions from the curriculum tracker and they did not finish the curriculum. They only managed to finish terms 1, 2 and 3 and they filled the curriculum tracker as required. Also, the HOD from KWABA revealed that even when the teacher's manage to finish curriculum, they did not fill in the curriculum tracker. Teachers were still not using the curriculum tracker in schools.

However, during the interview the researcher picked up that the extent of curriculum coverage had improved but not the way it is expected. It can be concluded that the reason for the minimal usage of the curriculum tracker is that teachers have little knowledge of the curriculum tracker, which also results in a negative attitude towards the tracker. Therefore, the extent of curriculum coverage is still not convincing. The HOD from ECU indicated that the teachers were working very hard to cover the curriculum in their classes. He indicated that compared to 2015 and 2017, the coverage of the curriculum has improved, save for challenges in the reflection part.

According to the findings of the study, the knowledge of the curriculum tracker and the negative attitude towards the curriculum tracker result in less practice of the curriculum tracker in the schools. During the interviews, and review of the curriculum tracker, books show the

minimal usage of the curriculum tracker. Some of the teachers always had excuses for not producing the curriculum tracker.

7.2.4 HOD knowledge of curriculum tool

The inquiry established that the HODs had knowledge of the curriculum tool. Their responses during the interviews indicated that the HODs knew what was required of them. It was also indicated that they had benefitted from the curriculum tracker because they could now have a professional conversation with their teachers. Therefore, the study established that the HODs were conversant and knowledgeable about the curriculum tracker. Furthermore, the findings indicate that the gap of the knowledge of the curriculum tracker is huge between teachers and HODs. For instance, when a new teacher comes into the school he/she do not get any workshop on the curriculum tracker. That also results in the poor usage of the curriculum tracker.

7.2.5 HOD attitude towards curriculum tool

The findings of this inquiry revealed that the heads of departments had a positive attitude towards the curriculum tool because it helped them to have organised work and made their work very simple because they knew what to ask from the teachers. Furthermore, the study revealed that the usage of the curriculum tool in the school by the HODs was very good. The positive attitudes of the HODs towards the curriculum tracker were largely due to the perceived benefits derived from the curriculum tracker. The study argues that HODs viewed the curriculum tracker as a facilitator to their work of checking teachers' work. Therefore, it was evident that the usage of the curriculum tracker by the HODs was good as compared to that of the teachers in Pinetown and Cetshwayo districts.

7.2.6 HOD practice of the curriculum tool

The findings revealed that HODs were using the curriculum tool to track teacher extent of curriculum coverage in the schools. The HODs found it difficult to give instructions to teachers because they were not motivated to use the curriculum tracker because they are given a lot of documents to use to try and cover the curriculum; for example, 1+9 lesson plans, ATP and curriculum tracker. It is evident from this study that the majority of HODs were using the curriculum tool as compared to the teachers. The HODs utilized the curriculum tool because it assisted them to check the teachers' work. The study concludes that most of the teachers need

a workshop on the reasons for the curriculum tracker and why they need to use it in their schools.

7.2.7 Challenges that hinder teachers and HOD usage of the tools

The findings from this study indicate that the usage of the curriculum tracker and tools is hindered by numerous challenges. The main challenge revealed by the teachers who participated in this study was lack of support from the schools in general and HODs in particular. It was noted that the implementation of any successful innovation in education requires institutional support from the HODs. Additionally, the findings from this study revealed that the early stages of the implementation of the curriculum tracker were hampered by lack of training. There was an apparent training gap as the teachers in Pinetown and Cetshwayo districts did not possess the essential skills required for the usage of the curriculum tool. The usage of the curriculum tracker in schools was also affected by teachers' attitude towards its introduction in schools. The teachers did not accept the usage of the curriculum tracker. It was evident that the teachers were not adequately prepared for the curriculum tracker and, therefore, had a negative attitude towards it. From the challenges identified by this study, it can be argued that most of the teacher-related challenges can be linked to lack of training. Teachers' negative attitudes were linked to lack of training prior to the introduction of the curriculum tracker. On the other hand, the usage of the curriculum tracker was also hindered by lack of resources. It was evident from the study that the schools in Pinetown and Cetshwayo districts lack resources for teaching and implementation of the curriculum tracker. In addition, the teachers and HODs revealed that the curriculum tracker arrived in the schools late and, therefore, negatively effecting the usage of the curriculum tracker. The findings from the study also revealed that there was lack of curriculum management.

7.3 Implication of the study

The findings of the study have implications for numerous stakeholders in general and teachers and HODs in particular. It is essential to note that the ultimate beneficiaries of this study will be the learners because improving teaching and usage of the curriculum tracker will result in better results in the classroom. However, it was a small scale study that explores the usage of the curriculum tracker in secondary (9, 10 & 11) teachers based on mathematics and science teachers in six schools in Pinetown and King Cetshwayo districts. The findings of this study

do not reflect the overall view of all the schools in these two districts. It was evident in this study that there was still minimal usage of the curriculum tracker in the schools. The findings showed that in order to promote the usage of the curriculum tracker in schools, teachers and their HODs need to be supported by the department of education and the PILO organisation. The study further revealed that the teachers were trying to use the curriculum tracker but it did not cater for all learners in terms of the pace. Therefore, the teachers need to try and make time for slow learners. It is important to monitor the schools, as some of the schools are from deep rural areas where the department officials do not go for monitoring. The results from the HODs indicate that they are doing a good job but not as required because of lack of monitoring from the department. Furthermore, the issue of resources also contributes to lack of teaching and learning to take place in the classroom.

7.4 Limitation of the study

This study has limitations in the theoretical framework which has different aspects however the researcher was aware that the framework has different aspect but choose to focus on multidimensional which has three aspect of the framework which is attitude, knowledge and practice. Second the study focused on the domain-specific as the study was exploring the uptake of the curriculum tracker in Pinetown and King Cetshwayo district by mathematics and science teachers looking on the objectives based on the content of the curriculum tracker and learner performance.

7.5 Recommendations

The study aimed at exploring secondary (9, 10 & 11) mathematics and science teachers use of the curriculum tracker in Pinetown and King Cetshwayo districts. A sample of twelve teachers and four HODs were interviewed. The findings cannot be generalized to other districts that did not participate in this study. Therefore, all the recommendations will be based on the findings during the analysis of secondary data and interviews.

7.5.1 Recommendations for PILO

Many challenges of curriculum coverage were identified by teachers and HODs, and they affect the implementation of Jiki imfundo. These include the late arrival of the curriculum tracker in the schools and the lack of resources for teaching and learning in the schools. Therefore, the researcher recommends that the heads of departments and teachers in the schools be given

enough support to implement Jiki imfundo successfully in the schools. Also, the researcher recommends that the curriculum tracker be delivered at schools early to enable teachers adequate time to prepare for the following year.

7.5.2 Recommendations for the department of education

The researcher recommends that the department of education provides formal training to the heads of the departments as well as to mathematics and science teachers across all the schools that are using the curriculum tracker. The training may be rendered in the form of the workshops that focus on the usage of the curriculum tracker at least once a year at the beginning of the year. It is crucial for the HODs to have a better understanding of the curriculum tracker to help teachers.

7.6 Conclusion

This study of curriculum usage by secondary (9, 10&11) mathematics and science teachers in Pinetown and King Cetshwayo districts confirms that curriculum coverage in mathematics and science is improving. However, there is still minimal usage of the curriculum tracker in schools. The whole teacher approach was used as the theoretical approach to underpin this study to understand the three components, which are the knowledge of teacher about the curriculum tracker, the attitude towards the curriculum tracker, and, lastly, the practice of curriculum coverage in schools. To answer the main research questions based on the findings, it was concluded that the majority of teachers were still not using the curriculum tracker in the schools. Therefore, teachers are still not finishing the curriculum in schools.

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APPENDIX A: SAMPLE OF SECONDARY DATA

ANNEXTURE B (2015 School Review)



School Review Session with HODs

We need to frame the visits as school support and review

Coaches must take copies of HOD tools / Principal tool and toolkits on the visits

(To be filled in by coach)

Date of Visit:	21.10.2015
CMC:	UMHLATHUZE
Circuit:	NGWELEZANE
Name of School:	ZIPHOZONKE SEC
Phase being reviewed: <i>(FP, Intermediate, Secondary)</i>	SECONDARY
Subject being reviewed: <i>(MATHS, EFAL, NATURAL SCIENCE)</i>	MATHS, NS,EFAL

Part 1: Semi-Structured Interview Questionnaire (30 minutes)

This form can be used for the HOD and teacher interviews.

- **Questions 1 – 3 ask HODs and Teachers**
- **Questions 4 – 7 ask HODs only.**

For each question the interviewer must ask for a response on the Likert scale and then have a conversation to explain the response. Try to find out what has worked well and what is not working; why trackers or HOD tool are not being used if that is that case. The interviewer must take notes in the blank spaces based on the answer of the interviewee).

Question 1: (HODs and teachers)	Yes	To Some Extent	Don't know	Not at all
2. In your opinion are the trackers being used routinely?		✓		
<p>Please elaborate on what is working and where you need more support from Jika 'iMfundo</p> <p>Not at all. Teachers in various subjects complained about congested activities in a day e.g. investigations that cannot be completed with the other activities in a day. In EFAL comprehension activities as most learners have a language barrier. Generally, the pace of learners is far behind the routine use of the tracker.</p> <p>Teachers however, acknowledged that the tracker assist them in planning activities and that a structure has been provided for them (break down of activities per minutes)</p> <p>More support from officials or school coaches was requested to track teachers progress especially methodology. Trackers were also acknowledged for accommodating with resources.</p>				

Question 3:	Yes	To Some Extent	Don't know	Not at all
	✓			
<p>Please elaborate on what is working and where you need more support from Jika 'iMfundo</p> <p>Scope too broad and Integration of activities, modification when its gets to schools and consolidation with other existing activities e.g. DBE 1+9 to save time and clashes of concepts More time to explain certain concepts</p>				

Question 4:	Yes	To Some Extent	Don't know	Not at all
3. Do you feel the HOD tool assists you to have professional and supportive conversations, based on evidence with teachers as a matter of routine? Have you started doing this? (HODs Only)				✓
<p>Please elaborate on what is working and where you need more support from Jika 'iMfundo</p> <p>Conversations not held due to not having tools regularly. Only term two trackers were received. HoD's not fully knowledgeable on having difficult conversations therefore needs refresher training</p>				

Question 5:	Yes	To Some Extent	Don't know	Not at all
4. Do you have a curriculum coverage supervision plan? Did you attend the HOD workshop? (HODs Only)				✓
<p>Please elaborate on what is working and where you need more support from Jika 'iMfundo</p> <p>Training was not attended hence no tools from JI. However school tools were being used but not as effective as the one's shown by the coach.</p>				

Question 6:	Yes	To Some Extent	Don't know	Not at all
5. Does your SMT look at learners' work to track learner achievement against curriculum coverage? (HODs Only)			✓	
<p>Please elaborate on what is working and where you need more support from Jika 'iMfundo</p> <p>Though the JI supervision plans are not used, the school draw a plan for the following activities before implementation: Book control is part of the monitoring plan on the calendar, followed by the teachers file, then diagnostic analysis per question and remedial plan.</p> <p>The HoD tool was not available but after explanation, the HOD's felt that it will assist them with guidance from now on, in terms of tracking, scheduling of appointments with teachers and moderation process.</p> <p>Following tools given for supervision</p> <ul style="list-style-type: none"> • Supervision plan • Guideline on conversation • Checklist for curriculum management 				

Question 7:	Yes	To Some Extent	Don't know	Not at all
6. Is your Principal monitoring assessment results against an assessment plan and against targets? <i>(HODs Only)</i>	✓			
<p>Please elaborate on what is working and where you need more support from Jika 'iMfundo</p> <p>Planning is done at the beginning of the year and communicated to staff for inputs. It is however not carried out as planned sometimes during the term due to other unplanned activities.</p> <p>For support it will be better if schools are aware of other activities that compete with curriculum implementation.</p>				

Part 2: Verification of Tracker Usage (15 minutes)

(Ask the HOD if you could see an example of a tracker from one of his or her teachers that is filling in the tracker. Remember to stress that we are not checking up on anyone at the school. Rather we are trying to determine the usefulness of our tool and where it can be improved. Looking at the tracker, coaches should tick the following boxes. It is sufficient to review one tracker for the subject and phase)

Teacher tracker: GRADE 8-9 EFAL AND NS *(put subject*

No	Checklist	Yes	Partly	No
1	The teacher has filled in the tracker Weekly lessons are being recorded		✓	
2	The tracker is complete and up to date from the 3 rd term		✓	
3	The tracker is being filled out in places but it appears to be very adhoc and incomplete			✓
4	The tracker reveals that curriculum coverage is up to date This is same as 2			✓

Part 3: Verification of HOD Tool Usage (15 minutes)

(Ask the HOD if you could see some of the weekly HOD checklists that have been filled in).

No	Checklist	Yes	Partly	No
1	Is there evidence of the HOD monitoring curriculum coverage with the Jika iMfundo tools?			✓
2	Is there evidence of the HOD monitoring curriculum coverage with the other tools not from Jika iMfundo?			✓
3	Is the HOD Curriculum Checklist filled out completely and correctly for term 3?			✓
4	Is the tool not being used at all			✓

Comments on Verification of Tools from Coaches:

Trackers were not fully completed as per expectations due to the following:

- Some subjects received term 4 trackers only according to their explanations (i.e. maths)
- English and natural Sciences received only two trackers (term 2-4)
- Teachers indicated that they were not clear who to ask for assistance to get material.
- All teachers, HoD and the principal indicated that they were not clear about how to use the tool as observed from their reflection and completion of the weekly activities. The principal and HoD's did not attend training therefore did not have materials such as checklists, supervision plan and monitoring tool

APPENDIX B: SAMPLE OF LETTER FROM THE PRINCIPAL

APPENDIX B: PERMISSION LETTER TO SCHOOL PRINCIPALS

To: The Principal

14 May 2018

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH IN YOUR SCHOOL

My name is Njabulo Dube who is a teacher of Mathematics at [REDACTED] Secondary School. I am currently registered and working on a full research thesis with the University of Kwazulu Natal. The title of the thesis is: Exploring secondary (9, 10&11) Mathematics and Science teachers' usage of the curriculum tracker in Pinetown and King Cetshwayo Districts. The study looks at the extent at which teachers and HODs are utilizing these tools by Jika iMfundo.

Teachers and HODs are requested to assist in this research project. The study will use interviews, and document reviews. Responses will be treated with confidentiality and pseudonyms will be used instead of the actual names. Participants will be contacted in time for interviews, and they will be randomly selected to participate in this study. Participation will always remain voluntary which means that participant have a choice to withdraw from the study for any reason, anytime if they so wish without any penalties.

(Researcher's signature)

(Date)

DECLARATION

I, S. A MADLALA [Signature] (NAME and SIGNATURE)

Principal on this day of 18 month MAY 2018, hereby grant permission to go ahead with the research in the above-mentioned School following the terms of reference noted in this request letter.



APPENDIX C: CONSENT FORM FOR THE PARTICIPANTS

School of Education, College of Humanities,
University of KwaZulu-Natal,
Edgewood Campus,

Dear Participant

Informed Consent Letter

My name is Njabulo Dube. I am a Masters student studying at the University of KwaZulu-Natal, Edgewood campus, South Africa. I am interested in exploring secondary Mathematics and Science teachers' usage of the curriculum tracker in Pinetown and King Cetshwayo District. To gather the information, I am interested in asking you some questions.

Please note that:

- Your confidentiality is guaranteed, as your inputs will not be attributed to you in person, but reported only as a population member opinion. The observation that will be made during the interview will only be used to deeply understand your perceptions in using the curriculum planner and tracker not for anything else; again they will not be attributed to you as a person.
- The interview may last for about 1,5 hours
- Any information given by you cannot be used against you, and the collected data will be used for purposes of this research only.
- Data will be stored in secure storage and destroyed after 5 years.
- You have a choice to participate, not participate or stop participating in the research. You will not be penalised for taking such an action.
- Your involvement is purely for academic purposes only, and there are no financial benefits involved.
- If you are willing to be interviewed, please indicate (by ticking as applicable) whether or not you are willing to allow the interview to be recorded by the following equipment:

Equipment	Willing	Not willing
Audio equipment		
Photographic equipment		
Video equipment		

I can be contacted at:

Email: njabulohappyboy.dube@gmail.com

Cell: 0786015137

My supervisor is Dr. Zanele Ndlovu who is a lecturer at the School of Education, Edgewood campus of the University of KwaZulu-Natal.

Contact details: email:Ndlovuz3@ukzn.ac.za Phone number: 072 401 1275.

You may also contact the Research Office through:

Ms P Ximba (HSSREC Research Office)

Tel: 031 260 3587

Email: ximbap@ukzn.ac.za)

Thank you for your contribution to this research.

APPENDIX D: ETHICAL CLEARANCE



10 September 2018

Mr Njabulo Happyboy Dube Z10500469
School of Education
Edgewood Campus

Dear Mr Dube

Protocol reference number: HSS/0758/018M (linked to HSS/0256/017)
Project title: Exploring Secondary (9, 10 & 11) Mathematics and Science teachers' usage of the Curriculum tracker in Pinetown and King Cetshwayo Districts

Full Approval Expedited Application

In response to your application received 9 July 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)
Humanities & Social Sciences Research Ethics Committee

/pm

cc Supervisor: Dr Zanele Ndlovu
cc Academic Leader Research: Dr SB Khoza
cc School Administrator: Ms Sheryl Jeeharain

Humanities & Social Sciences Research Ethics Committee
Dr Shenuka Singh (Chair)

Westville Campus, Govan Mbeki Building





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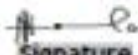
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APPENDIX E: CERTIFICATE OF EDITING

B C	S C	BE STILL COMMUNICATIONS For effective communication solutions	bestcommunications@gmail.com landamasuku@gmail.com +27835841854; +27618043021
			Professional EDITORS Guild
CERTIFICATE OF EDITING			
<p>This document certifies that a copy of the thesis whose title appears below was edited for proper English language usage, grammar, punctuation, spelling, and overall style by Dr Nhlanhla Landa whose academic qualifications appear in the footer of this document. The research content and the author's intentions were not altered during the editing process.</p>			
<p>TITLE: EXPLORING SECONDARY (9, 10 & 11) MATHEMATICS AND SCIENCE TEACHERS' USAGE OF THE CURRICULUM TRACKER IN PINETOWN AND KING CETSHWAYO DISTRICTS</p>			
<p>AUTHOR: NJABULO H. DUBE (STUDENT NO. 210500469)</p>			
<p>Note: The edited work described here (48 208 words) may not be identical to that submitted. The author, at their sole discretion, has the prerogative to accept, delete, or change amendments made by the editor before submission.</p>			
<p>DATE: 31 JULY 2019</p>			
EDITOR'S COMMENT			
<p>The author was advised to effect suggested corrections in regards to clarity of terms, consistency in structure and logic, and expression.</p>			
<p> Signature</p>			
<p>PhD Applied Linguistics (UFH), MA Applied Linguistics (MSU), BA (Honours) English and Communication (MSU) Professional Membership: A member of the Professional Editors Guild</p>			

APPENDIX F: TURNITIN REPORT

8/7/2019

Turnitin

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CHAPTER ONE: INTRODUCTION AND BACKGROUND OF THE STUDY 1.1

Introduction The formation of the schooling system differs from country to country. Although it differs, its ultimate goal is to ensure that effective education is provided. In South Africa, the dominant school formation structure in public schools includes the school management team (SMT), which consists the principal, deputy principal, and Heads of Departments (HODs) in charge of different subject areas. Depending on student numbers, some schools have two Deputy Principals. Each school then consists of teachers and learners. Among other structures that contribute to the running of the school is the School Governing Body (SGB). The SGB consists of the Principal and elected parents, teachers, non-teacher staff and, in secondary schools, it also includes learners. All these bodies have the same mandate to ensure the effective functioning of the school. Van der Berg, Taylor, Gustafsson, Spaull, and Armstrong (2011) stress that effective schools require well-selected individuals as principals, together with management teams that understand and fulfil their roles as leaders of the curriculum, and ensuring that an organized environment conducive for learning is present. While all these bodies are, among other things, expected to ensure the effective functioning of the schools, the teachers and Heads of departments are the people at the ground level and who are expected to implement and manage the curriculum. Effective implementation of the curriculum requires support and monitoring; however, in the past there has been excessive monitoring, with limited support (Reinke, Herman, & Stormont, 2013). One of the causes of this lack of support is, evidently, the top-down approach in the South African Education, where policies are designed and decided on by various experts and filtered down to school for teachers and HODs to implement. In order to ensure that implementation takes place, constant monitoring is central. While monitoring is necessary, support should precede monitoring. Education for all is a global commitment to provide quality basic education to all children (Darling-Hammond, 2015). Education is a basic human right and a significant factor in the development of children, communities, and countries. According to Türkkan (2012), the primary aim of education is to sustain individual and societal improvement. The author further states that the educational programs and policies play a key role in this social and individual progress. Education enables people to develop analytical skills and cognitive abilities, and also teaches children to analyse information and to exploit this acquired knowledge (Kiggundu & Nayimuli, 2009). Bhardwaj (2016) posits that education is the vehicle of knowledge, self-preservation, and success. Drawing from these authors, I posit that education not only gives us a platform to succeed but the knowledge of social conduct, strength, character, and self-respect. However, good education is premised on a well-structured curriculum and delivery of the curriculum depends on motivated teachers. 1.2 Background of the study South African schools have been performing very poorly in recent years, and among the many reasons articulated in literature and departmental reports is the lack of curriculum coverage in schools. Curriculum coverage has been shown to be an important variable for explaining young pupils' academic progress (Plewis, 2010) and its lack thereof has been identified as detrimental to the education system. In the words of Bhardwaj (2016, p. 24); Education is an essential human virtue, a necessity of society, the basis of good life and sign of freedom and education is important for the integration of separate entities. While literature emphasises the importance of education for the success of the country, there has been evidence in the past and currently that the education system in South Africa is in crisis and interventions are a state of urgency. The major crisis has been strongly articulated in relation to mathematics and the sciences