MATHEMATICS TEACHERS' PREPAREDNESS IN IMPLEMENTING THE NAMIBIA SENIOR SECONDARY CERTIFICATE ADVANCED SUBSIDIARY CURRICULUM LEVEL

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ABSTRACT

Since Namibia's independence in 1990, the education system has undergone significant reforms including the implementation of the Namibia Senior Secondary Certificate Advanced Subsidiary (NSSCAS) curriculum in 2021. Despite these reforms, Mathematics performance in the Ohangwena region remains notably poor. This study investigated the preparedness of Advanced Subsidiary (AS) Mathematics teachers in implementing the NSSCAS curriculum in five selected secondary schools within Ohangwena region, focusing on three research questions: 1) What is the level of readiness of AS Mathematics teachers in implementing the NSSCAS curriculum? 2) What factors influence the teacher's preparedness? 3) What strategies can enhance teachers' effectiveness? Using a qualitative research approach with a descriptive case study design, the study involved a focus group discussion with 16 participants, supplemented by non-participant observations and document analysis for data triangulation. The findings reveal that, although teachers have a general understanding of the NSSCAS curriculum, they encounter significant challenges such as inadequate training, insufficient teaching resources, limited lesson time, and the lack of continuous professional development. To address these issues, the study recommends comprehensive training programs, improved resource allocation, curriculum adjustments to better align lesson time with curriculum demands, and the establishment of a robust monitoring and evaluation framework. These recommendations are crucial for enhancing teacher readiness, ensuring effective implementation of the NSSCAS Mathematics curriculum, and improving Mathematics education quality and student learning outcomes.

Keywords: Mathematics teachers, preparedness, curriculum, implementation, NSSCAS, secondary education.

DECLARATION

I, INAMUTILA N.N. KAMBONDE hereby declare that this study **"**Mathematics Teachers' Preparedness in Implementing the Namibia Senior Secondary Certificate Advanced Subsidiary Curriculum Level**"** is a true reflection of my research and that this work or part thereof has not been submitted for a degree at any other institution of higher education. Wherever contributions of others are involved their contributions are acknowledged with due reference.

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Inamutila N.N. Kambonde		April 2024
Name of Student	Signature	Date

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DEDICATION

This study is dedicated to my late father, Valendinus Kambonde Haitembu, in honor of his unwavering love. Your guide light and legacy continue to inspire me every day. It’s also dedicated to my mother, meme *Mkwamalanga wange*, Liina yaMatheus for her solid support and encouragement. Your patience and love have been my cornerstone throughout this journey. To MYSELF, for the faith that endured a storm, for not giving up even though the probability was very high. **DEAR SHANGEH, THIS IS YOURS.**

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LIST OF ABBREVIATIONS AND ACRONYMS

AIR – American Institute for Research

CAS - Cambridge Advance Subsidiary

DNEA – Directorate of National Examination and Assessment

HOD – Head of Department

MoEAC – Ministry of Education, Art and Culture

NIED – National Institute for Education Development

NSSCAS – National Senior Secondary Certificate Advanced Subsidiary

CHAPTER 1: INTRODUCTION

1.1 Background of the study

Education has been characterised as a driving force for the social and economic development of any nation, preparing learners to meet the growing demand for higher education and job opportunities in the 21st century (Chemagosi, 2020). Since gaining political independence from the South Africa colonial rule in 1990, the Namibian education system has undergone numerous reforms, primarily through curriculum reviews (Ministry of Education, Arts, and Culture [MoEAC], 2016). The most recent review occurred in 2013, following a Cabinet directive that responded to a resolution from the 2011 National Education Conference, aiming to realign the education system with the long-term goals outlined in Namibia Vision 2030 (MoEAC, 2016).

The concerns of the MoEAC (2012-2013) regarding inadequate training and unachieved objectives led to the implementation of a revised curriculum in 2015 (National Institute for Educational Development (NIED), 2020). The latest basic education reform included the introduction of the Namibian Senior Secondary Certificate Advanced Subsidiary (NSSCAS) level course which is equivalent to the Cambridge Advanced Subsidiary (CAS) and was implemented in 2021. The curriculum must be adaptable and responsive to the evolving needs of the time, making it crucial to stay updated with changes (Hakutumbulwa, 2021). The curriculum was implemented in phases, as shown in Table 1.

Table 1 Implemented phases of the revised curriculum

Phase/ Grade	**Year of implementation**
Junior Primary Phase (Pre-Primary, Grades 1-3)	
Pre-primary, Grades 1-3	2015
Senior Primary Phase (Grades 4-7)	
Grades 4-7	2016
Junior Secondary Phase (Grades 8-9)	
Grade 8	2017
Grade 9	2018
Senior Secondary Phase (Grades 10-12)	
Grade 10	2019
Grade 11	2020
Grade 12	2021

Source : Ministry of Education(Advertisement, 2014)

The study done by Lochner et al. (2015) argues that teachers play a crucial role in determining whether a curriculum is delivered consistently, effectively, and with the desired impact to support student progress and growth. Understanding the factors that facilitate or hinder teachers' effective implementation of a new curriculum can provide valuable insights for assisting them with curriculum changes (Early et al., 2014). Jerotich et al. (2017) emphasised that successful curriculum implementation relies on providing teachers with relevant training in all aspects of the subject and promoting learner-centred teaching methodologies. Therefore, Mathematics teachers should receive proper training and induction to ensure that they feel confident in delivering the content and purpose of the materials they use, leading to accurate curriculum implementation (American Institute for Research [AIR], 2016).

Furthermore, the curriculum developers only focus on amendments to the curriculum, but turn a blind eye to the implementation. They do not do regular monitoring and evaluation of the implementation of the curriculum to identify areas of improvement and ensure alignment with the curriculum content (Angula, 2015). The intended outcomes in the teaching and learning process cannot be realised until the teacher is adequately prepared (Mulenga, 2015). Mulenga further argued that teachers need to be adequately prepared for them to achieve the intended goals. Hence, for any change in the curriculum to be effectively implemented, there is a need to equip teachers with the necessary knowledge and skills. Tomáš and Pešková (2017) also contended that teachers' perceptions and attitudes are crucial factors in the successful implementation of new curriculum reforms.

Mathematics is a key subject at the Advanced Subsidiary (AS) level, as it equips learners with the skills, knowledge, concepts, and processes needed to explore, model, and interpret numerical and spatial relationships and patterns in the world. According to the National Institute for Educational Development (NIED) (2016), Mathematics is a vital tool for everyday life and is crucial for the advancement of science, technology, and commerce. However, the NSSCAS Mathematics results for 2021 and 2022 indicated a national trend of low academic performance (DNEA, 2021; 2022). Therefore, this is what prompted the researcher to carry out this study which aimed at exploring Mathematics teachers’ preparedness for the implementation of the Mathematics Advanced Subsidiary level (NSSCAS).

1.2 Problem Statement

The Ministry of Education, Arts, and Culture (MoEAC) introduced the Namibia Senior Secondary Certificate Advanced Subsidiary (NSSCAS) level in 2021 as part of its education reform agenda aimed at improving the quality of education and aligning it more closely with global standards (MoEAC, 2016). The NSSCAS curriculum is designed to provide an advanced level of subject matter, preparing students for higher education or specialized fields. However, its implementation has highlighted several challenges, particularly in Mathematics, where the results in the Ohangwena region revealed significant struggles. The average performance in Mathematics was 30.8% in 2021 and dropped further to 17.0% in 2022, illustrating a concerning trend in student achievement (Professional Development Advisory Services, 2023).

This decline in performance points to potential gaps in Mathematics teachers' preparedness, an essential factor in effectively delivering the NSSCAS curriculum. Teachers' ability to manage the curriculum's complexity, coupled with their readiness to apply advanced teaching methods and assessment strategies, significantly impacts students' learning outcomes. However, without adequate support in professional development, many teachers face difficulties in adapting to the new standards and expectations. Consequently, the effectiveness of NSSCAS implementation in Mathematics is closely tied to the level of investment in ongoing teacher training and resource provision. Improved teacher preparedness through focused professional development initiatives may be critical in bridging the gap in student performance and ensuring the success of the NSSCAS curriculum reforms.

Mandukwini (2016) recommended that teachers be consulted to document their experiences in implementing new curricula to record challenges and take appropriate measures to address these. Since the AS level was only implemented in 2021, there exists limited literature on Mathematics Advanced Subsidiary level experiences in the Namibian context; hence the possible challenges experienced during the implementation are yet to be documented. It is against this background that this study aimed to explore Mathematics teachers' preparedness for the AS curriculum-level implementation, focusing on the five selected secondary schools in Ohangwena Region.

1.3 Research Objectives

The main research objective of this study was to explore the Mathematics teacher's preparedness in the implementation of the Namibian Senior Secondary Certificate Advanced Subsidiary (NSSCAS) level in five selected secondary schools of the Ohangwena region.

The study addressed the following questions :

1. How prepared are the Mathematics teachers regarding the implementation of the Mathematics Advanced Subsidiary level?
2. What factors influence the preparedness of Mathematics teachers in implementing the Advanced Subsidiary level?
3. What strategies can be implemented to ensure that Mathematics teachers are prepared to implement the Advanced Subsidiary curriculum level?

1.4 Significance of the Study

The study may provide the MoEAC with recommendations for the effective preparedness of Mathematics AS teachers for AS curriculum implementation. By gaining a deeper understanding of teachers' preparedness in implementing the AS Mathematics curriculum, new strategies can be developed for the Ministry of Education, Arts, and Culture (MoEAC) to adjust current subject policies and regulations, thereby improving the effectiveness of AS level implementation. Additionally, AS Mathematics teachers can utilise the research findings to evaluate and assess their own performance, identifying areas of strength and weakness to use as a framework for their professional development and improvement. Furthermore, the research may contribute to the body of knowledge on Mathematics teachers' preparedness to effectively implement Mathematics Advanced Subsidiary level in Namibia.

1.5 Limitations of the Study

The study was conducted in five selected secondary schools in the Ohangwena Education Region only, thus the findings will not be generalised to other regions. Though the results can not be generalised, the information on Mathematics teachers's preparedness can be helpful to other teachers teaching Mathematics AS-level at other schools in other regions.

1.6 Delimitations

The study focused exclusively on Mathematics AS teachers from five selected secondary schools in the Ohangwena Region. Given that the current curriculum implementation impacted only grade 12 Mathematics teachers, it was crucial to gather their perspectives on their readiness to teach Mathematics at the AS level.

1.7 Definition of Terms

Curriculum

In this study, curriculum is defined as the instructional document that outlines the content to be taught and the methods for teaching a specific subject, including associated assessment methods and criteria (Oxford Dictionary, 2021).

Curriculum implementation

In this study, curriculum implementation refers to the process of putting into practice the officially prescribed course of study, syllabus, and subjects in schools. It encompasses how teachers deliver instruction and conduct assessments using the resources specified in the new curriculum (Oxford Dictionary, 2021).

Teachers' preparedness

Teachers' preparedness in this study refers to teachers' interpretation of AS goals, content, assessment, competencies, and organizing learning experiences (Oxford Dictionary, 2021).

NSSCAS-level

NSSCAS level refers to the curriculum that was implemented in 2021 and is known as, the Namibian Senior Secondary Certificate Advanced Subsidiary (NSSCAS). It is equivalent to the Cambridge Advanced Subsidiary (CAS).

New curriculum

The NSSCAS level curriculum.

Old curriculum

The NSSCO/H

1.8 Chapter Summary

Chapter 1 introduces the research topic on Mathematics teachers' preparedness for the implementation of the Namibian Senior Secondary Certificate Advanced Subsidiary (NSSCAS) level. It emphasises the importance of education and aligning the education system with the 21st-century demands. The Chapter discusses the history of curriculum reforms in Namibia and the need for proper training and support for teachers during curriculum changes. It highlighted the low academic performance in Mathematics with the specific focus on the Ohangwena region. The research objectives and questions are presented, along with the significance of the study. The Chapter concludes by stating the study's limitations and delimitations, as well as defining key terms for clarity.

CHAPTER 2

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

This literature review examines existing research and theoretical frameworks relevant to the preparedness of Mathematics teachers for implementing the Namibia Senior Secondary Certificate Advanced Subsidiary (NSSCAS) curriculum. As Namibia's education system undergoes reform, especially with the introduction of NSSCAS, the role of teachers as key agents in curriculum delivery becomes essential. Effective implementation of the NSSCAS curriculum depends significantly on teachers' readiness, which is influenced by their knowledge, training, and available resources. This chapter explores the critical role of teachers as mediators in curriculum reform, their perceptions of curriculum changes, and the factors impacting their preparedness for curriculum implementation. Through a review of theoretical foundations, this chapter contextualizes the challenges and support structures that shape teachers' effectiveness in the NSSCAS curriculum rollout, ultimately providing insights to guide future strategies for enhancing Mathematics education in Namibia.

This Chapter offers a thorough summary of the relevant studies on Mathematics teachers' preparedness in implementing the Namibia Senior Secondary Certificate Advanced Subsidiary Curriculum Level. It delves into the existing body of knowledge, providing a comprehensive review of scholarly research, theoretical frameworks, and empirical investigations that shed light on the crucial aspects of teachers' readiness to effectively deliver the advanced Mathematics curriculum in Namibia.

2.2 Theoretical Framework

This study is informed by the Practical Theory of Teaching, as proposed by Handal and Lauvas (1987). This theory emphasises that effective classroom teaching hinges on a teacher's preparedness, which is shaped by their values, beliefs, knowledge, professional identity, and actions within the classroom. According to Handal and Lauvas, teachers' preparedness is not merely a function of their theoretical knowledge but also their practical application of this knowledge in teaching situations.

The Practical Theory of Teaching asserts that teachers bring a practical dimension to their teaching, characterised by their ability to integrate their values, beliefs, and experiences into their instructional practices (Rajagopalan, 2019). This theory underscores the necessity for teachers to possess both theoretical knowledge and practical experience to be effective educators. It posits that teachers need to continuously develop and apply their practical theories to adapt to and implement revised curricula effectively (Rajagopalan, 2019).

In the context of this study, the Practical Theory of Teaching provides the framework for investigating Mathematics teachers' preparedness to implement the revised NSSCAS curriculum. It shapes the study by focusing on how teachers' personal and professional attributes such as their values, skills, and knowledge affect their readiness to deliver the curriculum effectively. The theory emphasises that successful curriculum implementation relies on teachers being properly equipped with the essential skills, knowledge, and values. Thus, this study uses the Practical Theory of Teaching to explore how well-prepared Mathematics teachers are and to identify the factors that influence their preparedness. It also helps in understanding how teachers' perceptions of their readiness align with their practical teaching abilities and the demands of the NSSCAS curriculum.

2.3 Literature Review

2.3. 1 Teachers as Change Agents in Education Reform

Phelokazi (2013) emphasised that teachers are vital agents of any educational reform and play a crucial role as mediators of the curriculum. Similarly, Fullan (2001) underscores the importance of teachers as central change agents, noting that they bear primary responsibility for the successful implementation of a new curriculum. Teachers play a crucial role as change agents in educational reform, serving as essential mediators of the curriculum (Phelokazi, 2013).

Research from other scholars supports this view. For instance, Hargreaves and Fullan (2012) explain that teachers are not merely passive recipients of educational change; they are professionals who play an active role in shaping reforms through their actions and decisions. Teachers' understanding and acceptance of curriculum changes are vital for meaningful reform implementation. When teachers internalize the goals of reform, they are more likely to support and sustain these changes over time, influencing student success.

According to Day and Leithwood (2007), teachers' professional knowledge, motivation, and beliefs are key in determining the success of educational reforms. They highlight that teachers' ability to tailor reforms to the specific needs of their students makes them invaluable participants in the reform process. Moreover, Biesta et al. (2015) emphasize that teachers' commitment to reform initiatives is directly linked to the success and sustainability of these changes. Teachers' insights contribute to the ongoing refinement of curriculum materials, teaching resources, and assessment methods, ensuring alignment with both policy goals and classroom realities.

Darling-Hammond and McLaughlin (2011) also reinforce the importance of teachers as change agents, noting that successful reform depends on teachers' engagement in professional learning communities where they can share insights, collaborate on solutions, and actively participate in the evolution of educational practices. These collaborative networks further enable teachers to refine their strategies and adapt reform initiatives to suit diverse student needs.

Teachers are at the forefront of implementing reforms and are responsible for the successful integration of new curriculum initiatives (Fullan, 2001). As agents of change, teachers have the power to influence the learning experiences and outcomes of their students through their instructional practices and pedagogical approaches. Their understanding, acceptance, and adaptation to the reformed curriculum are vital for its effective implementation. In educational reform, teachers are at the forefront of translating policy into action. They are the ones who interact directly with students, bridging the gap between curriculum objectives and actual classroom instruction. As change agents, teachers have the ability to adapt and refine instructional strategies to address the diverse needs of their students, ensuring the effective implementation of the reformed curriculum.

Moreover, teachers' understanding, acceptance, and adaptation to the reformed curriculum are crucial for its successful integration. When teachers embrace and internalise the goals and principles of educational reform, they can effectively communicate and implement these changes in their classrooms (Fullan, 2001). Their commitment and ownership of the reform initiatives are essential for sustaining and institutionalising the changes over time. Teachers' professional knowledge and expertise are invaluable in shaping the content, pedagogy, and assessment practices of the reformed curriculum. Teachers' insights and experiences inform the development and refinement of curriculum materials, instructional resources, and assessment tools. By actively participating in curriculum development and decision-making processes, teachers can ensure that the reform aligns with the needs and realities of their students.

2.3.2 Teachers' Perceptions of the Reformed Curriculum

This section explores how teachers view curriculum reforms, focusing on factors that shape their perceptions, including professional development, curriculum content, and classroom support. By examining these perceptions, the section highlights the need to address teacher concerns and provide comprehensive support to ensure successful curriculum adaptation and enhanced student learning experiences.

2.3.2.1 Focusing on Curricula Amendment and Overlooking its Implementation

Mathematics teachers in Angula's (2015) study noted curriculum developers focus solely on amendments, overlooking implementation and failing to follow up on teacher and student struggles with the reformed content. This oversight in the implementation process can have significant consequences for the effectiveness of the curriculum. Without proper attention given to implementation, the intended goals and objectives of the amended curriculum may not be achieved. The study conducted by Shilongo (2021) sheds light on the concerns raised by Mathematics teachers regarding the lack of support and follow-up from curriculum developers regarding the implementation of curriculum amendments.

Mathematics teachers feel that while changes to the curriculum are made, there is insufficient attention to how these changes are being executed in the classroom, leaving teachers and students struggling to adapt.

In addition to the aforementioned study, other scholars supported the notion that curriculum amendment without due consideration for implementation can lead to various challenges. For example, a study by Smith (2022) found that when curricula are modified without adequate support or training for teachers, they may struggle to understand and effectively teach the new content. Germuth (2018) found that when curricula are modified without adequate support or training for teachers, they may struggle to understand and effectively teach the new content. This lack of support can result in decreased student engagement, and learning difficulties, and ultimately hinder the intended educational outcomes.

Furthermore, neglecting implementation and follow-up can create a gap between curriculum developers and teachers. Teachers may feel isolated and unsupported in dealing with the reformed curriculum, which can lead to frustration and resistance to change. This was evident in the study by Angula (2015), where teachers expressed their struggles in coming to terms with the new content due to the lack of support and guidance from the curriculum developers.

2.3.2.2 Teacher’s Content Knowledge

Teacher’s content knowledge refers to a teacher’s depth of understanding of the subject matter they teach. It encompasses not only familiarity with the fundamental concepts and facts but also an ability to interpret, organize, and convey this information effectively to students. Content knowledge is essential for quality teaching, as it directly affects teachers' confidence, instructional practices, and students' comprehension of complex material (Ball, Thames, & Phelps, 2008).

Nakanyala (2020) conducted a study examining the impact of the reformed curriculum, specifically focusing on the introduction of new contents that were not present in the previous version of the curriculum. The study revealed that teachers were facing significant challenges in dealing with the new content. The addition of new content in the curriculum can pose difficulties for teachers who are accustomed to the previous version. These teachers may lack familiarity with the new topics and may not have received adequate training or resources to effectively teach them. As a result, they may struggle to understand the content themselves and find it challenging to deliver it to their students. Supporting the findings of Nakanyala (2020), a study by Johnson (2019) found that when teachers are confronted with unfamiliar material, they may experience feelings of uncertainty and inadequacy. This lack of confidence can negatively impact their instructional practices and hinder student learning.

Moreover, the introduction of new content in the curriculum without proper implementation support can lead to a lack of alignment between the curriculum and classroom instruction. In a study by Thompson (2021), it was observed that when teachers are not adequately prepared to teach new content, they may fall back on outdated teaching methods or skip unfamiliar topics. This inconsistency between the curriculum and actual instruction can impede student comprehension and hinder their ability to meet the desired learning outcomes. Furthermore, the challenges faced by teachers in dealing with new content can also affect their motivation and job satisfaction. A study by Martinez (2022) revealed that when teachers feel ill-prepared to teach certain topics, they may experience increased stress and frustration. This can have a negative impact on their overall job satisfaction and potentially lead to burnout.

2.3.2.3 Monitoring and Guidance

Monitoring and guidance in education refer to the processes through which educational leaders, such as school administrators, curriculum specialists, and instructional coaches, oversee and support teachers' implementation of curriculum and instructional practices (Darling-Hammond et al., 2017).

Manson (2004) emphasises the crucial role of instructional leaders in ensuring effective curriculum implementation. These leaders are responsible for providing curriculum direction, inspiring and energising teachers, motivating and mediating educational policies, mentoring, supporting teachers, and monitoring their progress. However, it is possible that Mathematics teachers have not received the necessary mentorship, guidance, or support from educational leaders, which can impede successful curriculum implementation. Effective mentorship plays a vital role in supporting teachers during curriculum implementation. A study by Nangolo and Simon (2021) found that teachers who received consistent and meaningful mentorship reported increased confidence, improved instructional practices, and better student outcomes. When mentors provide guidance specific to the new curriculum content, teachers are better equipped to navigate challenges and deliver the reformed material effectively.

Educational leaders also play a critical role in mediating educational policies for teachers. They should ensure that policies align with the goals and objectives of the reformed curriculum (Shilongo, 2021). Additionally, the governing body should communicate these policies to teachers and provide the necessary resources and training to support their effective implementation. Thompson (2019) highlights the importance of policy coherence and support from administrators in facilitating successful curriculum implementation. Monitoring the progress of teachers is another essential responsibility of instructional leaders. Regular classroom observations, feedback sessions, and data analysis can help identify areas of strength and areas needing improvement. This information can guide targeted support and professional development opportunities for teachers.

A study by Davis (2019) emphasises the significance of ongoing monitoring and feedback in ensuring continuous improvement and successful curriculum implementation. Furthermore, instructional leaders should inspire and energise teachers through their leadership practices. They should create a positive and supportive school culture that values innovation, collaboration, and professional growth. Harris and Adams (2019) indicates that positive leadership practices contribute to increased teacher motivation, job satisfaction, and commitment to the implementation of educational reforms.

2.3.2.4 Time Allocated for Mathematics Lessons

According to Angula (2015), Mathematics teachers express concerns about the time allocated to Mathematics lessons on the timetable. It is alleged that the time provided for these lessons is often insufficient, with most lessons being allocated only 45 minutes in duration. This limited time frame can pose challenges for effective teaching and learning Mathematics. The research supports the notion that the duration of instructional time can impact student achievement. Nangolo and Simon (2021) found a positive correlation between increased instructional time and improved student outcomes in Mathematics. When students have more time dedicated to Mathematics lessons, teachers can cover the content more comprehensively, engage students in deeper learning experiences, and provide adequate time for practice and consolidation.

Furthermore, the duration of Mathematics lessons can influence the effectiveness of instructional strategies used by teachers. A study by Thompson (2019) highlights that longer lesson durations allow for the implementation of varied instructional approaches, such as group work, problem-solving activities, and hands-on experiences. These pedagogical strategies are essential for promoting active student engagement, critical thinking, and conceptual understanding in Mathematics. The limited time allocated for Mathematics lessons can impact teachers' ability to address individual student needs. In a study by Martinez (2022), teachers reported that shorter lesson durations hindered their capacity to provide personalised instruction and support for struggling students. With insufficient time, teachers may feel rushed to cover the curriculum, leaving less opportunity for targeted interventions and differentiation.

Moreover, the time constraints in Mathematics lessons can impact the pace of instruction. Some students may require additional time to grasp complex Mathematical concepts, while others may need opportunities for extension and enrichment. A study by Davis (2019) suggests that longer lesson durations provide the flexibility needed to adjust pacing, allowing teachers to better address the diverse learning needs of their students. The limited time allocated to Mathematics lessons can affect teachers' ability to engage students in meaningful mathematical discourse. In a study by Harris and Adams (2019), teachers expressed the challenge of fostering in-depth discussions and promoting Mathematical reasoning within a restricted time frame. Extended discussions and collaborative problem-solving activities are essential for developing students' Mathematical thinking and communication skills.

2.3.3 Factors that Impact Preparedness for Curriculum Changes

Mandukwini (2016) emphasises that the inadequate availability of essential resources significantly affects the implementation of curriculum changes. In Namibian schools, the lack of required resources presents a particular challenge for Mathematics teachers, hindering the effective implementation of curriculum changes. Providing necessary materials and resources is crucial for teachers to adequately prepare and concentrate on teaching their students. Singh (2012) emphasises that when teachers have access to essential materials, they can allocate their time and energy to planning and instructional delivery, rather than spending valuable time searching for materials they do not have. The availability of resources enables teachers to create engaging learning experiences, design appropriate assessments, and provide students with the necessary tools to explore and understand the new curriculum content.

Implementing curriculum changes without the relevant resources can cause significant stress and strain for teachers. Mandukwini (2016) suggests that the lack of necessary resources can have serious consequences, negatively affecting teachers' morale in implementing planned curriculum changes. Teachers may become overwhelmed and frustrated by their inability to meet the demands of the new curriculum due to a shortage of teaching aids, textbooks, manipulatives, technology, or other essential resources. This can hinder their ability to effectively deliver the curriculum and result in a diminished sense of efficacy and job satisfaction.

In addition to the availability of physical resources, the provision of professional development opportunities is another crucial factor in preparedness for curriculum changes. Teachers need access to quality training and ongoing support to enhance their pedagogical knowledge, content understanding, and instructional strategies aligned with the new curriculum (Shilongo, 2021). A study by Shoopala (2022) emphasises the importance of professional development in empowering teachers to effectively implement curriculum changes and improve student outcomes.

Furthermore, effective communication and collaboration among stakeholders play a significant role in preparedness for curriculum changes. Administrators, curriculum developers, and teachers must engage in open and transparent communication to ensure a common understanding of the goals, objectives, and expectations of the new curriculum (Nangolo & Simon, 2019). Collaboration allows for the exchange of ideas, sharing of best practices, and collective problem-solving, which can enhance teachers' preparedness and implementation of the curriculum (Davis, 2019).

Moreover, Shoopala (2022) highlights the importance of collaborative professional learning communities in supporting teachers during curriculum changes. The time allocation for professional development and planning is critical for teachers to adequately prepare for curriculum changes. Teachers require dedicated time to engage in collaborative planning, curriculum mapping, and instructional design aligned with the new curriculum. Insufficient time for professional development and planning can hinder teachers' ability to fully grasp the new content and develop effective instructional strategies. Harris and Adams (2019) highlights the importance of allocating protected time for teachers to participate in meaningful professional development and planning activities.

2.3.4 Need for Proper Teachers Training to Prepare for Curriculum Implementation

Angula (2015) emphasises that teachers require training to effectively understand and implement the curriculum. Without adequate training, teachers may face challenges in interpreting and delivering the curriculum content, leading to ineffective instruction and reduced student achievement. Phelokazi (2013) suggests that employing properly trained individuals, preferably teachers with teaching experience, can help minimise confusion and stress during curriculum implementation. Teachers who have received specific training related to the curriculum can better understand its objectives, content, and pedagogical approaches. This enables them to plan and deliver instructions that align with the curriculum's goals and meet the need of their students.

Furthermore, inadequate training of teachers can negatively impact student performance both nationally and internationally, as highlighted by Angula (2015). Teachers who lack proper training may struggle to effectively convey the curriculum content, resulting in students' limited understanding and poor academic outcomes. On the other hand, well-trained teachers possess the necessary knowledge and instructional strategies to engage students, enhance their learning, and achieve the desired educational objectives (Kasanda, 2020).

Mulkeen (2021) argues that for the effective implementation of the curriculum, teachers must possess several qualities, including being well-trained, highly motivated, dedicated, and professionally competent. Proper training equips teachers with the necessary pedagogical skills, content knowledge, and assessment strategies to effectively deliver the curriculum. Moreover, motivation and dedication are crucial in driving teachers to invest time and efforts in planning engaging lessons, adapting instruction to meet diverse student needs, and continuously improving their teaching practices.

Additionally, ongoing professional development plays a vital role in maintaining and enhancing teachers' competence in curriculum implementation (Johannes, 2021). Peterson et al. (2019) emphasise the importance of ongoing training and support for teachers to adapt to evolving educational practices and effectively implement curricular changes. Professional development opportunities provide teachers with updated knowledge, instructional techniques, and resources to align their teaching with the changing curriculum requirements.

Moreover, a study by Mulkeen (2021) emphasises the significance of clinical practice and mentoring in teacher preparation programs to ensure that teachers are well-prepared for curriculum implementation. Effective teacher training programs integrate practical experiences, such as classroom observations, micro-teaching sessions, and mentoring, to bridge the gap between theoretical knowledge and real-world practice (Shoopala, 2021). These experiences offer teachers opportunities to apply their learning in real classroom settings, receive feedback, and refine their instructional approaches (Kasanda, 2020).

In contrast, while previous studies mentioned in the context did not address teachers' preparedness for implementing the Namibia Senior Secondary Certificate Advanced Subsidiary (NSSCAS) curriculum, this study sought to address that research gap. It specifically aimed to explore and examine teachers' preparedness for implementing this curriculum by investigating various aspects, including their knowledge, skills, training, resources, and support systems. Furthermore, the study investigated how well teachers are acquainted with the NSSCAS curriculum, whether they possessed the necessary subject matter expertise, and whether they have received adequate training to effectively deliver the curriculum content.

2.4 Chapter Summary

This literature review synthesised the existing knowledge and research on Mathematics teachers' preparedness in implementing the Namibia Senior Secondary Certificate Advanced Subsidiary Curriculum Level. It explored the strategies and interventions that have been proposed or implemented to enhance Mathematics teachers' preparedness to implement curricula effectively. By examining successful initiatives from Namibia and other similar contexts, teachers play a crucial role as agents in educational reform and are responsible for the successful implementation of the curriculum and should not be overlooked during the implementation of the curriculum. By critically analysing previous studies, the introduction of new content in the curriculum without proper support and guidance can lead to lack of alignment between the curriculum and the classroom interaction. Therefore, ongoing monitoring, training and guidance is highly recommended for a successful Mathematics teachers' preparedness for Mathematics AS curriculum implementation. Moreover, the limited time duration for Mathematics lesson with inadequate availability of essential teaching and learning resources significantly influences the effectiness of the implementation the Mathematics AS curriculum. The insights gained from this review informs the subsequent chapters and provides a valuable foundation for proposed recommendations and strategies to improve the Mathematics teachers' preparedness for Mathematics AS curriculum implementation in Namibia.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter outlines the methods employed to collect and analyse data from participants. It covers the research design, study population, sampling procedures, research instruments, data collection methods, data analysis, and ethical considerations.

3.2 Research Design

The study utilized a qualitative research approach with a descriptive case study design. A qualitative research approach is an interpretive methodology that aims to explore and understand human experiences, behaviors, and perspectives in their natural contexts (Creswell & Poth, 2018). Unlike quantitative research, which focuses on numerical data and statistical analysis, qualitative research emphasizes rich, descriptive data, allowing for a nuanced understanding of complex social phenomena. Qualitative research is particularly effective for exploring participants' lived experiences, emotions, and perceptions, which cannot be easily quantified (Denzin & Lincoln, 2018).

In the context of this study, a qualitative approach was chosen because it enabled participants to share in-depth descriptions of their experiences and the challenges they face in implementing the Mathematics NSSCAS curriculum . This approach allowed for a comprehensive exploration of teachers' preparedness, providing insight into their individual perceptions, struggles, and adaptive strategies. Through semi-structured focus group discussion, observations, and document analysis, the qualitative approach facilitated an open-ended examination of the complexities involved in curriculum implementation, yielding valuable data that might otherwise remain hidden in a purely quantitative study (Merriam & Tisdell, 2016).

A descriptive case study design within the qualitative approach further strengthened the study by focusing on a specific context the experiences of Mathematics teachers in implementing the NSSCAS curriculum. Case studies are well-suited for exploring “how” and “why” questions and provide detailed insight into particular situations or issues within real-world contexts (Yin, 2018). This design was appropriate for gaining a holistic understanding of the factors influencing teachers’ preparedness and identifying practical implications to inform policy, practice, and future educational research.

Descriptive case study refers to a type of qualitative design that aims to describe and summarise characteristics, behaviours, or variables of interest within a population or sample (Bhandari, 2020). The descriptive case study design best suits this study, as it allows for a comprehensive, context-sensitive exploration of Mathematics teachers' preparedness for implementing the NSSCAS Mathematics curriculum. Therefore, this design was most appropriate for the study, as it focused on exploring Mathematics teachers' preparedness for implementing the Advanced Subsidiary (AS) level curriculum. The qualitative case study approach provided the necessary depth and detail to understand the teachers' experiences and challenges, making it well-suited to address the research objectives.

3.2 Population

Population is defined as the complete group of individuals, events, or objects of interest that researchers want to study. It represents the full set of cases from which researchers can draw conclusions (McMillan & Schumacher, 2010).

The primary objective of this study was to explore the Mathematics teachers' preparedness for the AS-level Mathematics curriculum on a targeted population consisting of 25 AS Mathematics teachers from 11 secondary schools that offer Mathematics at AS level curriculum in Ohangwena region .

3.4 Sample and Sampling Procedures

Sample and Sampling Procedure section describes the methods used to select participants from the broader population for the study. The sample represents a subset of the population that reflects its characteristics, allowing the researcher to draw conclusions about the entire population from this smaller group (Creswell, 2014). Sampling procedures, such as random and purposive sampling, ensure that the sample accurately represents the population, enhances the reliability of the findings, and addresses specific research questions effectively (McMillan & Schumacher, 2010).

In this context, the researcher made use of purposive sampling to select five secondary schools that were early adopters of the AS-level Mathematics curriculum. This decision was made to capture insights from teachers with direct, early experiences in implementing the new curriculum, who are likely to offer valuable perspectives on the challenges and strategies involved in adapting to the AS-level content (Patton, 2015). These five schools were purposively chosen as they were among the first in the region to implement the Mathematics AS-level curriculum since its inception in 2021. By selecting schools that were at the forefront of this curriculum rollout, the study aimed to gain valuable insights from teachers who had first-hand experience in implementing the AS-level Mathematics program.

Each selected school has between two to five AS Mathematics teachers. All the 16 Mathematics AS-level teachers from the five purposively selected secondary schools participated in focus group discussion. Furthermore, ten AS Mathematics teachers were purposively sampled for observation. The purposive selection of ten AS Mathematics teachers was guided by their experience of having teaching Mathematics AS level for three or two years, positioning them as pioneers and likely to have encountered and addressed various challenges unique to the initial implementation phase.

3.5 Data Collection Tools

Three distinct research instruments were employed in this study to provide a compreh

ensive and multi-faceted understanding of the research topic. These instruments were the observation guide, focus group discussion guide, and document analysis guide.

3.5.1 Observation Guide

Observation guide is an instrument used to systematically record and assess behaviors, interactions, or practices within a specific setting. It is often used in qualitative research to collect data on real-time occurrences, providing insights into participants' actions and environments without relying on self-reported data. Observation guides help ensure that researchers focus on specific areas of interest, improving consistency and depth in the data collected (Merriam & Tisdell, 2016).

An observation guide was utilised as a research instrument in this study. Non-participant observation was employed to assess teachers' preparedness in interpreting and delivering AS-level Mathematics content. This method involved systematically watching and recording teachers' instructional practices and classroom interactions. The focus was on evaluating how effectively teachers understood and conveyed the curriculum material, as well as the strategies and techniques they used to facilitate student learning. By observing teachers in their natural classroom environments, the study aimed to gather detailed insights into their pedagogical approaches, the practical application of their training, and their ability to address student needs within the framework of the NSSCAS Mathematics curriculum.

Observing classrooms and teachers provides real-time insights into their actions (Hakutumbulwa, 2021). The researcher attended two AS-level Mathematics lessons at each selected school as a non-participant observer. The observed teachers were chosen through a purposive sampling by considering teachers who had been teaching Mathematics AS since inception as they remain on the forefront and driver of the curriculum. The observations provided firsthand data on instructional strategies and contributed valuable context to the study by capturing the day-to-day realities of the educational environment.

3.5.2 Focus Group Discussion Guide

Focus group discussions (FGDs) are a qualitative data collection method that brings together a small group of participants to discuss a specific topic guided by a facilitator. This approach enables the researcher to gather in-depth insights on participants' attitudes, perceptions, and experiences, and it fosters group interaction that can lead to richer data than individual interviews might provide (Krueger & Casey, 2015).

A focus group interview guide, consisting of semi-structured open-ended questions, was created to facilitate in-depth discussions and gather detailed insights into Mathematics teachers' preparedness for implementing the NSSCAS Mathematics curriculum. The focus group method was selected because it enabled the researcher to thoroughly explore participants' thoughts, experiences, and perceptions, thus providing a nuanced understanding of the challenges and strategies associated with curriculum implementation. By bringing together sixteen AS-level Mathematics teachers, the focus group discussion encouraged the sharing of diverse perspectives and experiences, helping to identify common themes and unique insights that might not emerge in individual interviews.

Additionally, the interactive environment fostered collaborative dialogue, enabling teachers to build on each other's responses and leading to deeper reflections and more nuanced insights. The open-ended questions helped the researcher gain a thorough understanding of the necessary strategies for preparing Mathematics teachers for the implementation of the NSSCAS Mathematics curriculum. Sixteen AS-level Mathematics teachers participated in the focus group discussion. A voice recorder was used to record the focus group proceedings for data analysis purposes.

3.5.3 Document Analysis Guide

The researcher analysed documents, such as the National Curriculum for Basic Education (2016), the Mathematics NSSCAS syllabus, teachers' lesson plans, and learners' Mathematics exercise books, to triangulate the findings from other sources like interviews. Document analysis was conducted to provide additional evidence and context, supporting the data obtained from observations and focus group discussions (Patton, 2015). The researcher analysed documents to identify key elements essential for understanding the implementation of the NSSCAS Mathematics curriculum.

Firstly, the alignment between the content and objectives of the National Curriculum and the Mathematics NSSCAS syllabus was assessed to determine how well these were reflected in teachers' lesson plans and students' exercises. Secondly, the analysis sought evidence of the recommended teaching strategies and evaluated how effectively these methods were applied in the classroom. Thirdly, the analysis focused on whether the expected learning outcomes, as specified in the curriculum and syllabus, were being achieved, as evidenced by learners' work. Lastly, the types and quality of assessments used were scrutinised to ensure that they were aligned with the curriculum guidelines.

3.6 Data Collection Procedures

The researcher obtained an ethical clearance certificate from the University of Namibia Decentralized Ethics Committee (DEC) and a permission letter from the Regional

Directorate of Education, Arts and Culture, as well as from the principals of selected secondary schools, to proceed with the study in the Ohangwena region. Five focus group discussions were conducted with a total of 16 Mathematics AS-level teachers, each discussion lasted about 30 minutes and scheduled after school hours to avoid lesson disruption. The teachers were organised into five focus interview groups, designated as Group A, Group B, Group C, Group D, and Group E, with each group comprising participants numbered from one to five. Additionally, two 40-minute lesson observations per school were conducted during school hours. To achieve triangulation, the researcher analyzed various documents related to teachers' preparedness for implementing the Mathematics NSSCAS level curriculum, including the National Curriculum for Basic Education (2016), the Mathematics NSSCAS syllabus, teachers’ lesson plans, and learners’ Mathematics exercise books.

3.7 Data Analysis

In this research project, a combination of qualitative data analysis methods was employed to thoroughly examine the collected data. These methods included thematic analysis for focus group discussions and observations, content analysis for document analysis, and triangulation for validation.

The thematic analysis was primarily used to analyze data from the focus group discussions and classroom observations. This process involved transcribing the recorded discussions and systematically reviewing them to identify and segment meaningful units of information. These segments were then coded and organized into categories, allowing for the emergence of key themes. The thematic analysis provided in-depth insights by revealing patterns within the data, offering a rich understanding of teachers' preparedness and classroom practices.

For the document analysis, content analysis was utilized to systematically interpret relevant written materials, such as curriculum documents and lesson plans. This process involved coding the textual data to identify recurring concepts, patterns, and themes. Content analysis allowed the researcher to extract valuable information from the documents, contributing to the study's comprehensive understanding of curriculum implementation practices.

To enhance the validity of the findings, triangulation was applied by cross-verifying themes and insights from the different data sources. By comparing data from focus group discussions, observations, and documents, triangulation helped to identify consistent trends and patterns, strengthening the reliability of the conclusions drawn from the research. This integrative approach ensured a well-rounded and credible analysis of the data.

3.8 Ethical Considerations

The ethical clearance certificate was obtained from the University of Namibia Decentralised Ethics Committee (DEC). This certificate was then used by the researcher to apply for a research permission letter from the Centre for Research Services at UNAM to conduct the study. Subsequently, an official permission letter was acquired from the Regional Directorate of Ohangwena Region to carry out the study within the region. Re-arrangement was made with each selected secondary school principal through a permission letter. Through a consent letter, the researcher obtained the participant's consent. Participants were informed of their right to withdraw from the study at any time if they felt uncomfortable. To ensure confidentiality, no names were recorded on the research instruments, and the names of the schools were not disclosed in the study's findings. The data collected were treated with the utmost confidentiality, with access limited to the researcher and supervisors. As a non-participant observer, the researcher was present to observe evidence as it unfolded in its natural setting. The collected data will be securely stored for three years after the study's completion, after which it will be destroyed by erasing the hard drive and shredding any hard copies.

3.9 Chapter Summary

This chapter provides a thorough examination of the study's methodology, encompassing the research design, data collection methods, data analysis procedures, ethical considerations, and the limitations and delimitations of the research. It offers a comprehensive guide to how the study was conducted, with a focus on ensuring the credibility and validity of the findings. The chapter justifies the use of a qualitative approach, specifically a descriptive case study design, which was selected to explore the preparedness of Mathematics teachers in implementing the AS-level curriculum. This design is particularly appropriate as it allows for an in-depth investigation into the teachers' experiences, practices, and the challenges they face in real-world classroom settings, providing rich, contextual insights into the complexities of curriculum implementation.

CHAPTER FOUR

PRESENTATION AND DISCUSSION OF FINDINGS

This chapter presents the findings of the research study, which explored the preparedness of Mathematics teachers for implementing the AS-level curriculum in the five selected secondary in Ohangwena region. The study covers a sample carefully selected to represent the broader population, providing insights into the overall readiness of Mathematics teachers in implementing the curriculum. The Chapter offers a detailed analysis and discussion of the results, emphasising key themes and patterns that emerged from the data. Additionally, the data collected from the focus group interviews, classroom observations, and document analysis are presented and analysed. The findings are qualitatively aligned with the study's objectives and research questions and are categorised into four themes: 1) Demographic characteristics of participants, 2) The aim of the NSSCAS curriculum, 3) The level of teachers' readiness in implementing the NSSCAS curriculum, and 4) The factors influencing effective preparedness for NSSCAS curriculum implementation.

4.1 Demographic Characteristics of Participants

The researcher needed to gather the demographic information of the participants to enable comparisons of the findings concerning demographic variables, including age, gender, and experience. In this study, there were a total of 16 Mathematics AS-level teachers from five purposively selected secondary schools. Among these teachers, seven were females, and nine were males. The number of participants in each group varied depending on the number of AS Mathematics teachers available at each school. The participants' ages ranged from 24 to 40 years.

Data on the gender of the teachers at the selected schools was gathered to explore any potential relationship between gender and teachers' preparedness in implementing the Namibia Senior Secondary Certificate Advanced Subsidiary (NSSCAS) curriculum. Including gender as a demographic variable allowed the study to assess whether preparedness levels differed by gender and to provide a more comprehensive understanding of the factors that may influence teachers' readiness for curriculum implementation. The distribution of respondents' gender is depicted in Figure 1 below.

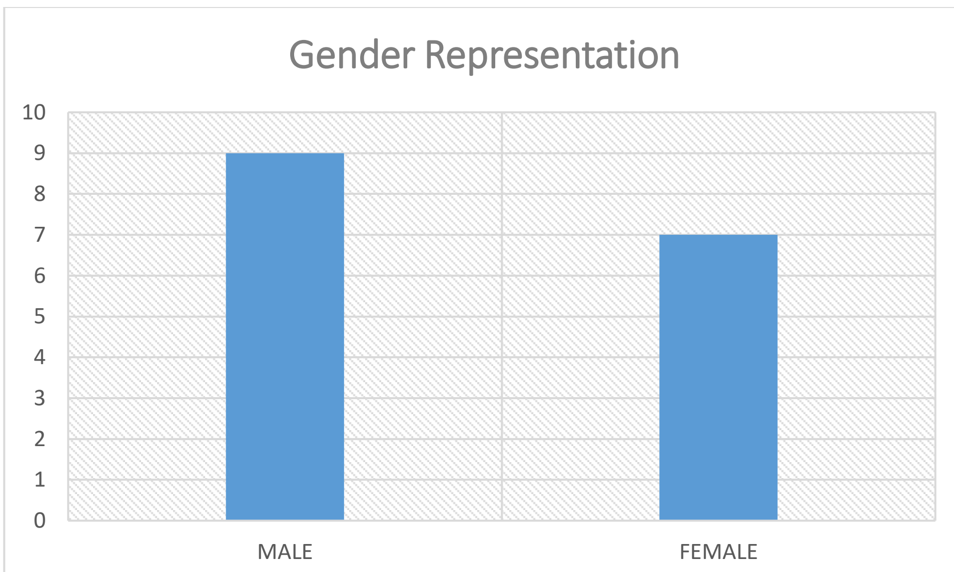

Figure 1: Gender Representation

Based on the data presented in Figure 1, the gender distribution reflected a slightly higher representation of male teachers, accounting for 56% of the sample, while female teachers represented 44%. Including both male and female teachers in the study was crucial to capturing a diverse range of perspectives and experiences regarding the implementation of the AS-level curriculum. By incorporating teachers of both genders, the study sought to provide a comprehensive understanding of the challenges, strategies, and needs of Mathematics teachers while taking into account any potential gender-related factors that might influence their preparedness for curriculum implementation. Research has demonstrated that gender can significantly impact teacher preparedness and effectiveness. For instance, Hakutumbulwa (2021) highlights that male and female teachers may bring different strengths to the classroom, which can affect their teaching styles and interactions with students. Additionally, Mandukwini (2015) found that female teachers often emphasise collaborative and student-centered learning environments, which can be beneficial for student engagement and learning outcomes.

Data on the age of the teachers at the selected schools were needed to determine teachers' preparedness in implementing the Namibia Senior Secondary Certificate advanced subsidiary curriculum. The distribution of respondents' age is depicted in Figure 2 below.

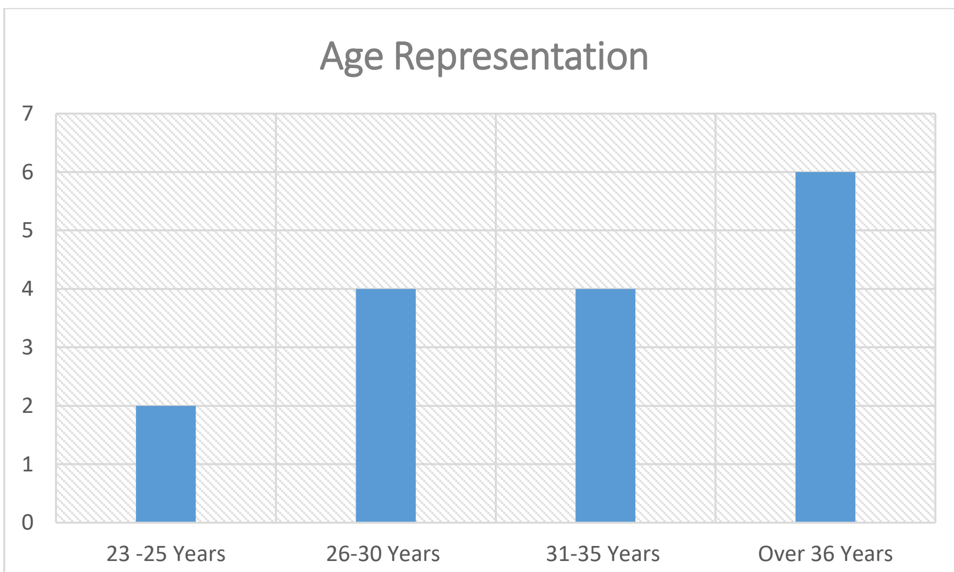

Figure 2: Age Representation

The study examined the age distribution of Mathematics teachers involved in this research study, which revealed a diverse representation across different age groups. According to Figure 2, the findings indicated the inclusion of both young and experienced teachers, with 12.5% falling within the 23-25 age range, 25% between 26-30, 25% between 31-35, and 37.5% aged 36 and above. The presence of teachers from various age groups enriched the study's findings by providing fresh perspectives from early-career teachers and insights from those with substantial experience. The diverse age distribution strengthened the research's quality, dependability, and generalisability, offering a comprehensive understanding of Mathematics teachers' preparedness for the AS-level curriculum.

Other studies have shown that age and career stage can significantly impact teacher preparedness and effectiveness. Younger teachers, often recent graduates, are likely to introduce innovative pedagogical approaches and integrate technology more readily into their teaching practices (Mulenga, 2015). However, they may lack the classroom management skills and practical experience that more seasoned teachers possess. This is supported by research from Martinez (2022), which emphasises that early-career teachers benefit significantly from mentoring and support from more experienced colleagues.

Data on the experience of the teachers at the selected Schools were needed to determine teachers' preparedness in implementing the Namibia Senior Secondary Certificate Advanced Subsidiary Curriculum. The distribution of respondents' experience is depicted in Figure 3 below.

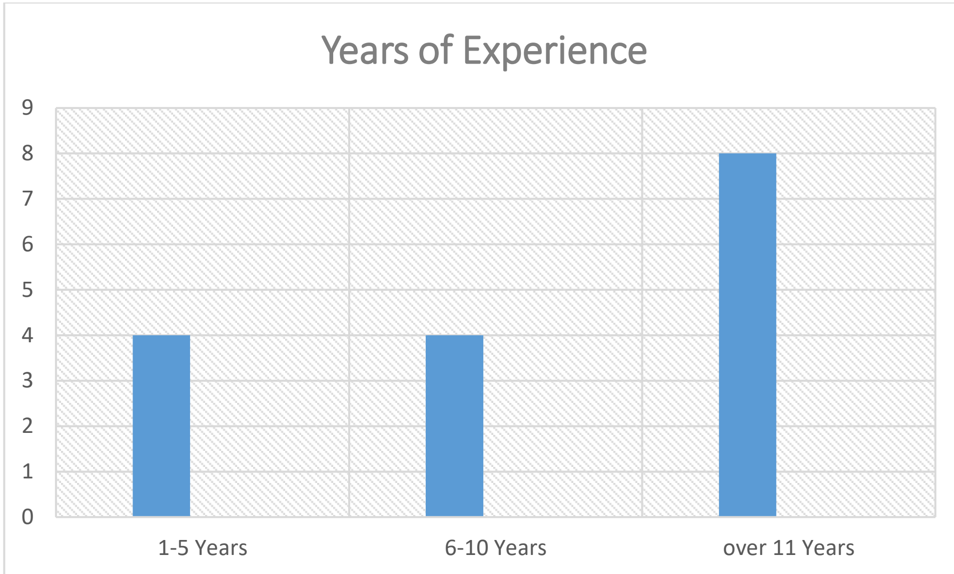

Figure 3: Years of Experience

The distribution of participants according to years of experience is displayed in Figure 3. Figure 3 above shows that the majority (50%), of the participants, had a considerable amount of experience, with their years of experience spanning over 11 years. Furthermore, 25% of participants have one to ten years of expertise, while the other 25% of participants also have experience ranging from six to ten years. These results demonstrate how participants in the study were distributed across a range of expertise levels.

In relation to Nakanyala (2020), who highlights that experienced teachers typically possess well-developed classroom management skills and a deeper understanding of the curriculum, this study suggests that the mix of experience levels among participants might impact their preparedness for implementing the NSSCAS Mathematics curriculum. Experienced teachers often bring strong classroom management skills and a deep understanding of curriculum content, which can positively impact their ability to effectively implement a new curriculum. Angula (2015) highlights that veteran teachers play a vital role in mentoring younger colleagues and providing stability within the educational environment. Additionally, Thompson (2019) suggests that experienced teachers significantly contribute to the professional development of early-career teachers, thereby fostering a collaborative and supportive teaching community.

4.2 AS Mathematics Teachers’ Views on their Preparedness for the Implementation of the Mathematics NSSCAS Curriculum

This section explores AS Mathematics teachers' perspectives on their preparedness for implementing the Namibia Senior Secondary Certificate Advanced Subsidiary (NSSCAS) curriculum. The insights gathered focus on the teachers' understanding of the curriculum’s goals, their readiness to apply its content and methodologies, and the challenges they face. Through focus group discussions and observations, various themes emerged, highlighting both the strengths and areas for improvement in teachers' preparedness.

4.2.1 The Aim of the NSSCAS Curriculum

This subsection provide a detailed analysis of teachers' views regarding the overarching aim of the NSSCAS curriculum.

The participants were asked to provide their views on whether the aim of the AS-level curriculum was effective. The following responses were gathered from participants across different focus groups.

Participant 1 Group A: “*The aim of the AS level is a very good one as it is helping to close the gap between grade 12 Mathematics and the university Mathematics entry courses as the majority of grade 12 NSSCO learners of the old curriculum used to find it very difficult to cope with first-year university Mathematics*”

Participant 2 Group B: "*I believe the aim of the AS level is beneficial because it provides students with a solid foundation in their chosen subjects. It helps them develop essential skills and knowledge that will be useful not only in higher education but also in their future careers."*

Teacher 3 Group C: "*From my perspective, the aim of the AS level is commendable as it allows students to explore different subject areas and make informed decisions about their future academic paths*"

Participant 4 Group D: *"The aim of the NSSCAS level is straightforward and it brought more advanced contents as compared to the old Curriculum"*

Participant 5 Group E: *"I believe that NSSCAS was aimed to foster knowledge and instil critical thinking"*

The responses highlight the effectiveness of the AS level in bridging the gap between grade 12 Mathematics and university entry courses, suggesting that the AS level curriculum provides a strong foundation for students. The curriculum provides learners with essential skills and knowledge for higher education and future careers. Additionally, the curriculum offers students the opportunity to explore various subjects, aiding them in making informed decisions about their academic and career paths.

These findings align with a study by Smith (2022), which found that when curricula are modified with adequate support and training for teachers, they are better able to understand and effectively teach the new content. This support leads to increased student engagement, improved learning outcomes, and the achievement of the intended educational goals.

The consensus among participants suggests that the AS level curriculum significantly enhances students' readiness for the challenges of university Mathematics and other subjects. This improvement in preparedness is crucial for their success in higher education. The curriculum's comprehensive approach not only bridges the transition from secondary to tertiary education but also promotes overall educational development by fostering critical thinking and a deeper understanding of subjects.

Furthermore, 5 participants indicated that the AS level's emphasis on advanced content and critical thinking aligns with modern educational objectives, aiming to produce well-rounded, critically thinking graduates. By equipping learners with the necessary skills and knowledge, the AS level supports their academic and professional success, making it a valuable addition to the educational framework. These findings are supported by studies conducted by Mulenga (2015) and Mandukwini (2016), which emphasise the importance of ongoing curriculum evaluation and improvement to address the evolving needs of students and the demands of higher education.

This suggests that the AS level influences students' academic decision-making processes. Supporting this, Phelokazi (2013) emphasises that teachers are pivotal in educational reform, acting as crucial mediators of the curriculum. Teachers play a significant role as change agents in implementing educational reforms and guiding curriculum integration (Phelokazi, 2013).

4.2.2 The Level of Teachers' Readiness in the Implementation of NSSCAS Curriculum

The following subsections provide a detailed analysis of teachers' views regarding the teachers' level of readiness in implementing the curriculum.

The participants were asked to provide their views on Mathematics teachers' preparedness for implementing the NSSCAS Mathematics curriculum. Below are some of the responses from the six participants across different focus groups.

Participant 1(Group A): "*I was ready, I had been teaching higher level Mathematics during the old curriculum and studying the syllabus, and the content seemed to be not difficult to me,"*

Participant 2 (Group B): "*As a Mathematics teacher, I felt adequately prepared to implement the Mathematics NSSCAS curriculum level. I had taken part in professional development programs and workshops specifically focused on familiarising teachers with the new curriculum. These sessions provided me with a deep understanding of the content, teaching strategies, and assessment methods aligned with the new curriculum."*

Participant 3 (Group C): "*I found the preparation for implementing the Mathematics NSSCAS curriculum level to be comprehensive and valuable. Our school provided us with training sessions that covered the key aspects of the new curriculum, including the changes in content, teaching methodologies, and assessment practices."*

Participant 4 (Group D): "*I have mixed feelings about the preparation for implementing the Mathematics NSSCAS curriculum level. While I have attended some professional development sessions, I still feel uncertain about certain aspects of the new curriculum. I believe there are areas where I need further training and support to confidently teach the content and apply the recommended teaching strategies."*

Participant 4 (Group E): "*To be honest, I don't feel ready to implement the Mathematics NSSCAS curriculum level. I haven't received any specific training or professional* *development related to the new curriculum. I am concerned about my ability to effectively teach the content and meet the expectations of the curriculum."*

Participant 3 (Group D): "*I haven't had much preparation for implementing the Mathematics NSSCAS curriculum level. There have been some brief discussions during staff meetings, but no dedicated training or workshops. I feel like I need more guidance and resources to understand the changes and adapt my teaching accordingly."*

These responses indicate that teachers' levels of preparedness vary widely. While some have gained from comprehensive professional development and support, others feel insufficiently prepared due to limited training and resources. This variation highlights a noticeable gap in professional readiness, underscoring the need for more consistent and equitable training opportunities. This disparity underscores the need for more consistent and comprehensive professional development opportunities to ensure that all teachers feel confident and adequately prepared to implement the new curriculum effectively. The significance of professional development in equipping teachers for new curricula is well-documented. These findings align with studies that have shown that comprehensive professional development programs enhance teachers' understanding of new content, teaching methodologies, and assessment strategies, leading to more effective curriculum implementation (Martinez, 2022; Mulenga, 2015). This reinforces the idea that targeted training is crucial for equipping teachers with the necessary skills and knowledge.

These additional responses provide a more balanced view of the participants' readiness to implement the Mathematics NSSCAS curriculum. The responses highlight a spectrum of preparedness among the participants. While some have attended professional development sessions, they still feel uncertain and acknowledge the need for further training and support. Some participants openly acknowledged feeling unprepared due to insufficient specific training and professional development related to the curriculum. There is a general agreement on the need for additional guidance and resources to implement the curriculum effectively. These findings are consistent with existing literature, which underscores the importance of comprehensive professional development for educators. According to Shilongo (2021), effective professional development should be sustained, collaborative, and focused on content-specific pedagogy. This supports the participants' feedback that ongoing training and support are essential for effective curriculum implementation.

Overall, the responses suggest that there is a variation in the level of readiness among participants to implement the Mathematics NSSCAS curriculum. While some feel sufficiently trained and prepared, others express uncertainty or lack of readiness, highlighting the need for comprehensive training and support to ensure successful implementation. These findings align with existing literature on the importance of adequate preparation and support for teachers when implementing new curricula. Mulkeen (2021) argues that effective curriculum implementation requires teachers to be well-trained, motivated, dedicated, and professionally competent. Proper training provides teachers with the necessary pedagogical skills, content knowledge, and assessment strategies essential for delivering the curriculum effectively (Singh, 2012).

The feedback from participants and the literature both emphasise the need for continuous and targeted professional development. Smith (2020) also stressed that professional development must be continuous and embedded within the teaching context, supporting the idea that initial training sessions are not enough without ongoing support and resources.

However, there are some differences highlighted in the literature that were not mentioned by the participants. Shilongo (2021) discusses the role of professional learning communities (PLCs) in supporting teachers' professional growth. This suggests an additional strategy for enhancing support systems that was not explicitly mentioned by the participants but could be beneficial.

Figure 4 below shows the level of teachers’ readiness in the implementation of the Mathematics NSSCAS curriculum.

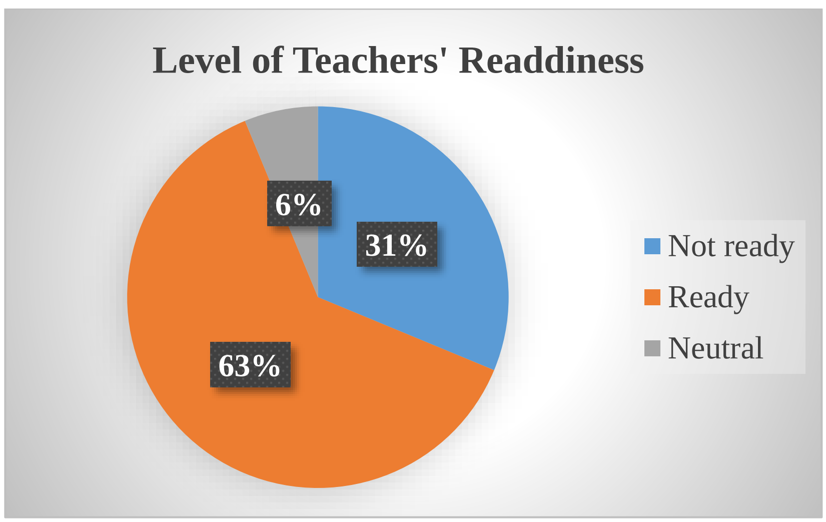

Figure 4 Level of Teachers' Readines

Based on figure 4 above, 63% of the participants felt prepared to implement the Mathematics NSSCAS curriculum level. The results suggest that, teachers have prior experience, have studied the syllabus, and have received comprehensive training from their schools, professional development programs, or workshops. This indicates the teachers’ confidence and readiness to teach the new curriculum. On the other hand, 6% of the participants expressed neutral feelings, indicating some uncertainty or the need for further training and support. The teachers have attended professional development sessions but may require additional guidance and resources. Additionally, 31% of the participants expressed that they did not feel adequately prepared to implement the curriculum. They reported a lack of specific training or professional development related to the new curriculum, underscoring the need for more thorough preparation.

These findings align with the study done by Johannes (2021), which indicated that ongoing professional development plays a vital role in maintaining and enhancing teachers' competence in curriculum implementation. Ongoing training ensures that teachers are equipped with the most current pedagogical skills and knowledge, which is crucial for effectively delivering the curriculum. Similarly, Peterson et al. (2019) emphasise the significance of continuous training and support for teachers to adapt to evolving educational practices and successfully implement curricular changes. Professional development opportunities provide teachers with updated knowledge, instructional techniques, and resources to align their teaching with the changing curriculum requirements.

Therefore, the studies by Johannes (2021) and Peterson et al. (2019) support the participants' responses by emphasising the necessity of ongoing professional development. They underscore that while a majority of teachers may feel prepared, there is a significant portion that requires additional support and training to achieve the same level of readiness. This comprehensive approach to professional development is crucial for ensuring all teachers are well-prepared to implement the Mathematics NSSCAS curriculum effectively.

4.2.3 Factors that Influence Effective Preparedness of NSSCAS Curriculum Implementation

This subsection provide a detailed analysis of teachers' views regarding factors influencing effective preparedness for NSSCAS curriculum implementation. The participants were asked to identify factors influencing the effective preparedness for implementing the Mathematics NSSCAS curriculum. The following are some of the responses provided by participants from different focus groups.

Participant 1 (Group A): *"If I am being honest, our country needed to have this kind of curriculum considering the global trends in education, relevance to the job market, alignment with international standards, and more, but I don't think the curriculum has started at the right time".*

Participant 2 (Group B): *"One factor that influences the effective preparedness of the NSSCAS curriculum implementation is the availability of resources. For teachers to effectively implement the curriculum, they need access to updated textbooks, teaching materials, and technological resources. However, our school has been facing resource constraints, and this has hindered the smooth implementation of the curriculum. Without adequate resources, it becomes challenging for teachers to deliver the curriculum content engagingly and effectively."*

Participant 3 (Group D): *"While the new curriculum brings in changes and updates to the teaching methods and content, many teachers have not received sufficient training to* *adapt to these changes. This lack of training hampers their ability to effectively teach the new curriculum and address the learning needs of the students."*

Participant 4 (Group D): "*The support from school administration plays a critical role in the successful implementation of the curriculum. When school leaders are actively involved and supportive, teachers feel more confident and motivated*."

Participant 2 (Group E): *"Teacher workload is another significant factor. With the introduction of the new curriculum, teachers are expected to adapt quickly while still managing their existing responsibilities."*

Based on the presented responses above, the effective preparedness for implementing the Mathematics NSSCAS curriculum is influenced by several interrelated factors, including timing, resources, training, administrative support, and workload. Addressing these issues comprehensively can enhance teachers' readiness and ability to implement the curriculum successfully. This requires strategic planning, adequate resource allocation, continuous professional development, strong leadership, and manageable workloads for teachers. By addressing these factors, educational institutions can foster an environment that supports effective curriculum implementation, which in turn can enhance educational outcomes for students. Introducing a curriculum prematurely or without adequate preparation time can hinder its effectiveness. These findings are supported by Mulkeen (2021) who emphasises that curriculum changes need to be well-timed to allow for sufficient teacher preparation and adjustment. Ensuring appropriate timing can enhance teachers' readiness and confidence in delivering the new curriculum. The availability of resources is vital for effective curriculum implementation. These findings align with Peterson et al. (2019) who highlight that adequate resources, such as updated textbooks and technological tools, are necessary for teachers to deliver curriculum content effectively. Resource constraints can hinder teachers' ability to engage students and provide high-quality education. Ensuring that schools are well-equipped with necessary resources is essential for successful curriculum implementation.

The conclusions drawn from the participants’ responses regarding factors that influence effective preparedness of NSSCAS curriculum implementation also underscore the importance of supportive leadership and the need to address teacher workload when implementing a new curriculum. Effective implementation requires not only strong administrative support but also measures to alleviate teacher workload and ensure teachers have the time and resources necessary to adapt to curriculum changes successfully. These findings are corroborated by a study by Smith (2022), which found that an excessive workload can significantly impede teachers' ability to effectively implement new curricula. Overburdened teachers have less time to plan, collaborate, and engage with new instructional strategies, negatively impacting student learning outcomes. Addressing workload issues through strategic planning and support can enhance teachers' readiness and effectiveness in delivering the curriculum.

Based on the study done by Nakanyala (2020), the addition of new content in the curriculum can pose difficulties for teachers who are accustomed to the previous version. These teachers may lack familiarity with the new topics and may not have received adequate training or resources to effectively teach them. As a result, they may struggle to understand the content themselves and find it challenging to deliver it to their students.

Supporting the findings of Nakanyala (2020), the study by Johnson (2019) found that, when teachers are confronted with unfamiliar material, they may experience feelings of uncertainty and inadequacy. This lack of confidence can negatively impact their instructional practices and hinder student learning (Martinez, 2022). Thompson (2021) observed that when teachers are not adequately prepared to teach new content, they may tend to rely on outdated teaching methods or omit unfamiliar topics altogether. This inconsistency between the curriculum and actual instruction can impede student comprehension and hinder their ability to meet the desired learning outcomes. Furthermore, the challenges faced by teachers in dealing with new content can also affect their motivation and job satisfaction. A study by Martinez (2022) revealed that when teachers feel ill-prepared to teach certain topics, they may experience increased stress and frustration.

4.2.4 Strategies to Ensure Teacher Preparedness for Implementing the Advanced Subsidiary Curriculum

This subsection provide a detailed analysis of teachers' views regarding strategies that could enhance teacher preparedness for curriculum implementationParticipants were asked to suggest strategies to ensure that teachers are adequately prepared to implement the Advanced Subsidiary curriculum. The following are some of the responses from different focus groups:

Participant 1 (Group A): "*There is a need for Mathematics AS learners to have their gadgets (laptops, computers, smartphones/tablets) with internet access for them to keep searching for more information on the internet, so they can be exposed to different questions and answering techniques.*"

Participant 2 (Group B): *"Professional development programs and workshops specifically tailored to the Advanced Subsidiary curriculum can greatly enhance teacher* *preparedness. These programs should focus on providing in-depth training on the curriculum content, teaching strategies, and assessment methods unique to the Advanced Subsidiary level. They should also incorporate opportunities for teachers to collaborate, share best practices, and receive feedback from experienced educators."*

Participant 3 (Group C): *"Creating a supportive learning community among teachers can contribute to their preparedness. Encouraging regular meetings, discussion forums, and sharing of resources can foster collaboration and collective learning. Teachers can exchange ideas, discuss challenges, and find solutions together, thereby enhancing their understanding and readiness to implement the Advanced Subsidiary curriculum."*

Participant 4 (Group D): *"Offering mentoring and coaching programs can be an effective strategy to support teacher preparedness. Experienced teachers can be paired with those who are new to the Advanced Subsidiary curriculum. The mentor can provide guidance, share their expertise, and offer support to the mentee. This personalised approach can help new teachers feel more confident and prepared to implement the curriculum effectively."*

Participant 3 (Group E): *"Providing access to comprehensive curriculum materials and resources is essential for teacher preparedness. This includes textbooks, supplementary materials, lesson plans, and assessment tools specifically designed for the Advanced Subsidiary curriculum."*

Based on the participants' responses, the suggested strategies emphasize the critical need for equipping teachers with the appropriate tools, resources, and skills to effectively implement the Advanced Subsidiary curriculum. These strategies highlight the significance of providing targeted professional development, access to relevant teaching materials, and ongoing support to ensure that teachers are well-prepared and confident in delivering the curriculum. Providing access to technology not only empowers students but also supports innovative teaching practices. On the other hand, professional development programs ensure that teachers are continuously improving their instructional techniques and staying updated with curriculum changes. This aligns with the notion that technology empowers both students and teachers by fostering creativity, collaboration, and critical thinking (Shoopala, 2021; Smith, 2022).

However, challenges such as access disparities, digital literacy gaps among educators, and the need for ongoing technical support highlight potential barriers to effective implementation (Mandukwini, 2016; Nakanyala, 2020; Phelokazi, 2013). Therefore, while technology can enhance teaching practices, equitable access and ongoing support are essential for maximising its benefits. To optimise these strategies (such as mentorship programs, peer learning communities, and regular updates on educational technology advancements), institutions could consider integrating ongoing support mechanisms. By fostering a culture of continuous learning and adaptation, educators can confidently navigate the challenges of implementing advanced curricula and ultimately enhance student outcomes.

In addition, based on the responses from participants, creating a supportive learning community among teachers is essential for fostering collaboration and collective learning. Regular meetings, discussion forums, and resource sharing platforms can facilitate the exchange of ideas, discussion of challenges, and co-creation of solutions. These findings align with the study done by Harris and Adams (2019) which highlights that the collaborative environment not only enriches professional development but also strengthens teachers' understanding of curriculum content and effective instructional strategies specific to the Advanced Subsidiary level.

Furthermore, the responses from teachers have shown that access to comprehensive curriculum materials and resources tailored specifically for Mathematics Advanced Subsidiary curriculum is fundamental. These resources include different varieties of textbooks, supplementary materials, and assessment tools that align with curriculum standards and learning objectives. These findings are consistent with the study by Mandukwini (2016), who indicated that having a diverse range of resources not only supports teachers in planning and delivering effective lessons but also ensures alignment with assessment practices and student learning outcomes.

By implementing strategies such as providing access to technology, offering tailored professional development, fostering a supportive learning community, and implementing mentoring and coaching programs, schools can significantly empower Mathematics teachers in the effective implementation of the Advanced Subsidiary (AS) curriculum. These strategies contribute not only to teacher preparedness but also to enhanced student learning outcomes, which aligns with the findings of this study.

Several studies reinforce these points. For instance, Nangolo et al. (2021) observed that teachers who received consistent, meaningful mentorship reported increased confidence, improved instructional practices, and better student outcomes. In this study, teachers who participated in professional development and received specific curriculum guidance from mentors were better equipped to overcome challenges and deliver reformed content effectively. This finding resonates with the current study, where teachers emphasized the value of targeted mentorship and guidance in navigating the complexities of the NSSCAS Mathematics curriculum.

Educational leadership also plays a crucial role. Shilongo (2021) notes that educational leaders should ensure that policies align with the curriculum’s goals and objectives, which parallels the findings in this study regarding the role of school leadership in providing teachers with necessary resources and support. Furthermore, Thompson’s (2019) research underscores the importance of coherent policy support from administrators, which this study found to be vital in creating an environment conducive to the AS curriculum's successful implementation.

Finally, Davis (2019) highlights the importance of ongoing monitoring and feedback in curriculum implementation, a finding echoed by teachers in this study who cited regular feedback and curriculum evaluation as key to continuous improvement. This feedback loop allows teachers to make adjustments and enhance their instructional practices, directly impacting student learning outcomes. Integrating these strategies and aligning them with the findings of this study offers a holistic approach to strengthening teachers' readiness to implement the AS curriculum, ultimately fostering an educational environment that supports both teacher and student success. Furthermore, instructional leaders should inspire and energise teachers through their leadership practices. Instructional leaders should create a positive and supportive school culture that values innovation, collaboration, and professional growth.

4.3 Observations

The researcher adopted a non-participant observer role to objectively assess Mathematics teachers' preparedness in implementing the Namibia Senior Secondary Certificate Advanced Subsidiary (NSSCAS) curriculum. By utilising predetermined criteria outlined in an observation guide, the researcher aimed to collect data and evaluate teacher performance. Before observations began, an observation sheet or checklist was developed to systematically record relevant data, covering various aspects of teacher preparedness aligned with NSSCAS curriculum requirements. The researcher' visits to the five selected secondary schools ensured a representative sample, with discreet observations conducted to avoid interfering with classroom activities. Systematic data recording facilitated documentation of observations, note-taking, and identification of patterns, offering valuable insights into teachers' level of preparedness. This structured approach enabled the systematic gathering of objective information, contributing to a comprehensive assessment of Mathematics teacher's performance and readiness for NSSCAS Mathematics curriculum implementation.

Lesson Planning and Preparations:

The researcher observed that out of the ten observed participants, seven had lesson plans that were meticulously crafted in alignment with the basic competencies and learning objectives specified in the NSSCAS syllabus. This careful planning reflects a strong adherence to the curriculum requirements and demonstrates the teachers' commitment to implementing the NSSCAS standards effectively. This attention to detail in aligning lesson plans with the syllabus indicates a systematic approach to curriculum implementation, ensuring that instructional activities are closely tied to the intended learning outcomes as specified by the NSSCAS guidelines. The lesson plans of these seven teachers encompassed all essential components, including introduction, presentation, learner activities, utilization of teaching aids, assessment strategies, conclusion, homework assignments, and provisions for compensatory teaching. Moreover, three teachers' lesson plans were seamlessly integrated into a broader scheme of work and yearly plan aligned with the NSSCAS syllabus. Similarly, findings from studies conducted by Nangolo and Simon (2021) revealed a positive correlation between increased instructional time and enhanced student outcomes in Mathematics. This underscores the significance of dedicating ample time to Mathematics lessons, allowing teachers to cover content comprehensively, engage students in deeper learning experiences, and facilitate sufficient practice and consolidation. Furthermore, the availability of resources was highlighted as pivotal, enabling teachers to craft engaging learning experiences, develop suitable assessments, and furnish students with the necessary tools to navigate and comprehend the new curriculum content (Singh, 2012).

Lesson Introduction:

In the research setting, observations indicated that eight out of ten AS Mathematics teachers excelled in delivering well-structured and engaging introductions to their lessons. This approach aligns with best practices in effective teaching, which emphasize connecting new content to students' prior knowledge to improve engagement and comprehension (Slavin, 2018). The observed teachers effectively reviewed previous homework, provided constructive feedback, and addressed misconceptions, which are essential practices in formative assessment that help reinforce learning and allow students to learn from their errors (Black & Wiliam, 2009).

Linking the new lesson content to prior knowledge is widely recognized as an effective strategy for engaging students and promoting deeper learning (Bransford, Brown, & Cocking, 2000). In this study, teachers structured their lesson introductions to bridge concepts from previous lessons, which aligns with theories of cognitive psychology suggesting that activating prior knowledge supports memory retention and understanding (Ausubel, 2000). Furthermore, the clear communication of learning outcomes observed in these teachers' practices allowed students to understand the goals and expectations for each lesson. Setting clear learning objectives has been shown to help students focus on key concepts and increases their motivation and sense of purpose in the learning process (Marzano, 2007).

The time allocation for professional development and planning is critical for teachers to adequately prepare for curriculum changes. The researcher further observerd that, two participants out of the ten teachers need dedicated time for collaborative planning, curriculum mapping, and instructional design to align with the new curriculum.

However, the effectiveness of these lesson introductions is closely linked to the time allocated for professional development and planning. Adams (2019) emphasises that insufficient time for professional development and planning can hinder teachers' ability to fully grasp new content and develop effective instructional strategies. Without adequate time for collaborative planning, curriculum mapping, and instructional design aligned with the new curriculum, teachers may struggle to deliver well-structured and engaging lesson introductions. Therefore, dedicating sufficient time to professional development and planning is critical for teachers to adequately prepare and enhance their instructional practices.

Lesson Presentation:

The observation revealed that teachers presented content clearly and engagingly, utilizing a variety of strategies to enhance communication. Six teachers effectively employed questioning, instruction, explanation, and feedback to maintain student engagement, asking open-ended and higher-level questions that encouraged critical thinking. They also continuously monitored attention, adapting their approach as needed to re-engage distracted students. The remaining four teachers promoted active participation through individual work, pair work, and group activities, offering clear instructions and guidance to ensure students understood their tasks. Additionally, frequent and supportive feedback was provided, both orally and in writing, fostering a positive learning environment and helping students improve their understanding.

These observations are consistently supported by the study done by Phelokazi (2013) which suggests that employing properly trained individuals, preferably teachers with teaching experience, can help minimize confusion and stress during curriculum implementation. Furthermore, well-trained teachers possess the essential knowledge and instructional strategies needed to actively engage students, promote effective learning, and achieve the intended educational objectives (Kasanda, 2020).

Subject Knowledge:

The researcher observed that 75% of the Mathematics teachers demonstrated a strong understanding of the subject, confidently addressing students' inquiries and clarifying concepts. For example, Teacher A was asked by a student to explain the concept of quadratic equations, and the teacher not only provided a detailed explanation but also used visual aids on the board to further illustrate the relationship between the equation and its graph. Additionally, Teacher B effectively responded to a student's confusion about Pythagoras' theorem by breaking the theorem down into simpler steps and offering real-life applications, which helped students grasp the concept more easily. This subject expertise not only clarified students' doubts but also deepened their understanding of complex mathematical concepts, enhancing their overall comprehension. The ability to offer such comprehensive explanations is a clear indicator of the teachers' mastery of the content and their capacity to foster a more enriching learning environment. The observation that Mathematics teachers demonstrated a robust understanding of the subject matter aligns with findings that emphasise the importance of teacher expertise in enhancing student learning outcomes (Peterson et al., 2019). When teachers confidently address student inquiries and provide clear explanations, it contributes significantly to students' deeper understanding of the subject (Peterson et al., 2019).

Additionally, Peterson et al. (2019) and Kasanda (2020) underscore the crucial role of continuous training and professional development for teachers. This ongoing support is essential for adapting to evolving educational practices and effectively implementing curricular changes. These professional development opportunities provide teachers with updated knowledge, instructional techniques, and resources, thereby aligning their teaching practices with changing curriculum requirements (Kasanda, 2020). Therefore, the aforementioned studies support the observation that well-prepared and knowledgeable teachers significantly impact student learning outcomes, especially in subjects like Mathematics where clarity and depth of understanding are paramount.

Teaching and Learning Media:

The researcher noted that, out of the ten observed Mathematics teachers at the selected secondary schools, nine effectively utilized various teaching and learning media to enhance the delivery of NSSCAS Mathematics concepts. For instance, Teacher C used interactive whiteboards to display mathematical problems, providing visual explanations that helped students better understand abstract concepts like algebraic expressions. Similarly, Teacher D incorporated videos and animations to demonstrate geometric principles, which helped to engage visual learners and clarified complex ideas. Eight of the participants also utilized textbooks, supplementary materials, technology, and other resources to further engage students and facilitate their understanding. Teacher E, for example, used online math simulations to demonstrate real-time changes in mathematical graphs, allowing students to manipulate variables and observe the effects directly. By incorporating a variety of media, such as textbooks, technology, and multimedia resources, the teachers catered to different learning styles and ensured a more comprehensive and dynamic learning experience for their students.

. These observations align with a study by Thompson (2019), which highlights that longer lesson durations allow for the implementation of varied instructional approaches. With extended lesson times, teachers can effectively integrate different media and teaching methods, such as group work, problem-solving activities, and hands-on experiences, thereby enriching the learning environment and better supporting student understanding. These pedagogical strategies are essential for promoting active student engagement, critical thinking, and conceptual understanding in Mathematics (Martinez, 2022).

Assessment and Closure:

The researcher further observed that assessment activities in these schools were closely aligned with the lesson objectives and basic competencies covered during the lessons. Four teachers used oral, written, and practical assessments to continuously gauge students' levels of understanding. Three teachers, provided exercises for practice or homework to reinforce the concepts learned in class. At the end of each lesson, most teachers summarised the main ideas and provided a comprehensive conclusion, ensuring that students gained a clear understanding of the key takeaways.

These observation results are supported by Harris and Adams (2019), who emphasise the need for protected time for teachers to engage in meaningful professional development and planning activities. Adequate time for professional development allows teachers to develop and refine their assessment strategies and lesson closure techniques. This ensures that assessments are effectively aligned with lesson objectives and that lesson conclusions reinforce the key concepts, enhancing overall student learning.

Classroom Management:

The researcher observed that, all ten Mathematics teachers demonstrated effective classroom management skills in handling disruptions and maintaining an inclusive learning environment. They employed various strategies to keep the students engaged and focused on learning. By establishing clear expectations, implementing structured routines, and cultivating a positive classroom climate, the teachers developed an environment that facilitated effective teaching and learning.

Overall, the observations conducted in the five selected secondary schools provided valuable insights into the Mathematics teachers' preparedness in implementing the

NSSCAS curriculum. Out of ten teachers, nine demonstrated proficiency in lesson planning, delivery, subject knowledge, use of teaching and learning media, assessment practices, and classroom management. The teachers' dedication to providing quality education and creating an engaging learning environment was evident throughout the observations.

These observations support Kasanda's (2020) findings, which assert that well-trained teachers are equipped with essential knowledge and instructional skills, including effective classroom management techniques. Kasanda (2020) emphasises that teachers with strong training are better prepared to manage classrooms effectively, ensuring a productive and inclusive learning environment.

4.4 Document analysis

Policy Documents

The researcher analysed the policy documents related to the implementation of the Namibian Senior Secondary Certificate Advanced Subsidiary (NSSCAS) level curriculum for Mathematics. This analysis highlights key findings regarding expectations, requirements, support mechanisms, resources, and teacher preparedness. These documents offer valuable insights into the framework and guidelines established by educational authorities to ensure the effective delivery of the NSSCAS Mathematics curriculum. The reviewed documents include the "National Curriculum for Basic Education (2016)" and subject-specific policies outlined by the Ministry of Education, Arts, and Culture (MoEAC). The researcher conducted a detailed examination of these documents to understand the framework and provisions set forth for effective curriculum delivery. The primary focus was on identifying expectations and requirements, which emphasise that teachers must possess deep subject knowledge and effective pedagogical skills, and are expected to engage in continuous professional development. The policy framework for the NSSCAS Mathematics curriculum exhibits notable strengths, including clear expectations for teachers regarding subject knowledge and pedagogical skills, which are essential for effective curriculum delivery. The provision of comprehensive support mechanisms, such as curriculum guides, training workshops, and mentorship programs, reflects a strong commitment to aiding teachers in their instructional roles. However, there are areas for improvement, particularly in bridging gaps between policy expectations and actual implementation, as well as addressing potential inconsistencies in resource allocation that could impact curriculum delivery. Continuous professional development is emphasised, highlighting the need for ongoing training to keep teachers updated with curriculum changes and teaching practices. Additionally, the alignment between practical support and policy expectations needs to be assessed to ensure that support mechanisms are effectively utilised. While pre-service and in-service training programs are essential for teacher preparedness, their effectiveness should be regularly assessed to ensure they meet the evolving needs of educators. Overall, while the policy framework is robust and well-intentioned, enhancing the practical application of policies and ensuring adequate resources are provided could significantly improve the effectiveness of Mathematics education.

Support mechanisms provided by the MOEAC include comprehensive curriculum guides, training workshops, and mentorship programs to aid teachers in their roles. Adequate resource allocation is essential for effective curriculum delivery, and the documents outline the necessary materials and tools required. Teacher preparedness is enhanced through both pre-service and in-service training programs, ensuring that teachers are well-equipped to meet curriculum goals, standardise assessments, and promote inclusivity. Through this analysis, the researcher aimed to identify the alignment between policy expectations and the practical support provided to teachers, thereby assessing the overall effectiveness of the policy implementation in fostering a conducive learning environment for Mathematics NSSCAS. These policy findings (Clear expectations for teachers regarding subject knowledge and pedagogical skills, the provision of comprehensive support mechanisms and continuous professional development) are supported by data from interviews and observations, providing insights into the practical realities of the implementation. Interviews with Mathematics teachers underscore their appreciation for continuous professional development programs, yet they encounter challenges related to resource availability and technological integration in the classroom (Angula, 2015). Observations across schools revealed varying levels of implementation effectiveness despite the benefits of curriculum guides and training workshops. Triangulating these findings emphasises the importance of consistent resource distribution and ongoing support to ensure teachers can effectively meet the demands of the Mathematics NSSCAS curriculum (Smith, 2022). This comprehensive approach, integrating policy analysis with empirical data, identifies both strengths and areas for improvement in curriculum implementation.

Curriculum Documents

The analysis of policy documents by the researcher, including the National Curriculum for Basic Education (2016) and the Mathematics NSSCAS syllabus, highlights detailed expectations for teachers, support mechanisms, and resources essential for effective curriculum implementation. These documents outline specific learning outcomes aimed at developing students' advanced Mathematical understanding and problem-solving skills, provide a structured approach to content delivery with recommended teaching strategies, and identify approved textbooks and instructional materials. Classroom observations indicate that although teachers generally follow curriculum guidelines, the effectiveness of their instructional practices and assessment methods varies significantly, with some schools demonstrating better alignment and implementation than others. Triangulating these findings shows a clear alignment between curriculum goals and classroom objectives but highlights practical challenges, such as inconsistent resource availability and the need for more targeted in-class support and professional development. Addressing these issues can enhance the overall effectiveness of the NSSCAS Mathematics curriculum implementation.

Evaluation and Assessment Materials

The analysis of evaluation and assessment materials related to Mathematics teachers' performance and students' achievement in the NSSCAS curriculum, conducted by the researcher, provides objective evaluations of their progress (NIED, 2020; Addico, 2022). The researcher examined assessment frameworks, sample assessments, and examiner's reports to gain insights into the challenges, successes, and recommendations related to teachers' preparedness and students' performance in the NSSCAS Mathematics curriculum (NIED, 2020; Addico, 2022). This analysis illuminated the performance of Mathematics teachers in implementing the NSSCAS curriculum by utilising assessment frameworks to establish criteria for objectively evaluating their performance (NIED, 2020; Addico, 2022). The materials highlighted areas of improvement for Mathematics teachers, helping identify specific areas where additional support may be needed (NIED, 2020; Addico, 2022). The examiner's reports offered valuable insights into the challenges encountered by both teachers and students with the NSSCAS curriculum, as well as recommendations for improvement (NIED, 2020; Addico, 2022). Through this analysis, the researcher aimed to provide a thorough evaluation of the NSSCAS Mathematics curriculum's implementation and identify actionable strategies to enhance teacher performance and student achievement.

The analysis of evaluation and assessment materials related to Mathematics teachers' performance and students' achievement in the NSSCAS curriculum offers objective evaluations of their progress (Smith, 2022; Shilongo, 2022; Nakanyala, 2020). These materials, including assessment frameworks, sample assessments, and examiner's reports, provide insights into challenges, successes, and recommendations for enhancing teacher preparedness and student performance. Assessment frameworks detail criteria for evaluating teachers' curriculum understanding and instructional strategies, revealing areas of strength and improvement for tailored professional development (Angula, 2015). Sample assessments benchmark student performance, guiding teachers to adjust their approaches to address common struggles. Examiner's reports analyse student performance in examinations, identifying common errors and suggesting improvements. Triangulating these findings with interview and observation data highlights the need for targeted professional development and consistent resource availability to enhance teacher effectiveness and student engagement (Smith, 2022; Shilongo, 2022; Nakanyala, 2020).

This integrated approach ensures improvement strategies are grounded in both empirical data and classroom experiences, addressing the most pressing needs.

4.5 Chapter Summary

Chapter 4 provides a thorough analysis of the participants' perspectives on Mathematics teachers' preparedness for implementing the AS-level curriculum. It addresses the challenges encountered, concerns raised, and recommendations offered by the participants, offering valuable insights for improving teacher readiness and ensuring effective curriculum implementation. The chapter includes an overview of the participants' demographics, key findings, and their recommendations, underscoring the necessity for updated pedagogical approaches, technology integration, and the provision of resources and support. The insights gained from this analysis contribute to improving Mathematics education by informing policymakers, curriculum developers, and educational institutions on areas requiring attention and improvement, ultimately leading to effective instruction and a rewarding learning experience for students aligned with the AS-level curriculum.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents conclusions derived from the results and offers recommendations for enhancing Mathematics teachers' preparedness in implementing the Namibian Senior Secondary Certificate Advanced Subsidiary (NSSCAS) curriculum. It begins with a summary of the research objectives and the questions addressed throughout the study.

5.2 Summary of Findings

The study aimed to investigate Mathematics teachers' preparedness for implementing the Mathematics NSSCAS curriculum at secondary schools in the Ohangwena region. It focused on evaluating the challenges faced by teachers and assessing the effectiveness of the curriculum in enhancing AS learners' understanding of Mathematics and their problem-solving abilities.

The research questions addressed the following aspects: teachers' experiences and perceptions of the NSSCAS curriculum, the challenges encountered in its implementation, the utilisation of prescribed teaching strategies and resources, and the impact of support mechanisms on the overall implementation process. The study employed a qualitative research approach, combining document analysis, focus group discussion with sixteen AS-level Mathematics teachers, and classroom observations to assess practical implementation. The study population comprised 25 AS Mathematics teachers from 11 secondary schools in the Ohangwena region that offer the Mathematics AS-level curriculum. The sample included a specific group of 16 Mathematics AS-level teachers who were randomly selected from five secondary schools in Ohangwena region.

The findings revealed that while teachers appreciate continuous professional development programs, they face challenges with resource availability and technological integration. Policy documents detailed expectations and support mechanisms for effective implementation, but interviews indicated a need for more continuous practical training and consistent access to technological resources and teaching aids. Classroom observations showed varying degrees of implementation effectiveness across schools. The study underscored the necessity for consistent resource distribution and ongoing support to ensure all teachers can meet the curriculum's demands effectively, highlighting both strengths and areas for improvement in the implementation of the Mathematics NSSCAS curriculum.

5.3 Conclusions

The major conclusion of this study is that, while some Mathematics teachers in the Ohangwena region feel prepared to implement the Namibian Senior Secondary Certificate Advanced Subsidiary (NSSCAS) curriculum, a significant number does not. About 63% of the teachers felt prepared due to prior experience and comprehensive training, whereas 31% felt unprepared, primarily due to inadequate training, insufficient resources, and limited administrative support. The study identified ongoing professional development, access to essential teaching materials, and robust administrative backing as crucial factors for improving teacher readiness. Ensuring these support mechanisms are in place is vital for enhancing the effectiveness of the NSSCAS curriculum implementation and ultimately improving student outcomes. Addressing these areas is crucial for enhancing teachers' readiness, ultimately improving student outcomes and the effectiveness of NSSCAS curriculum implementation. Despite its focus on five schools in the Ohangwena Region, the insights gained are valuable for informing policy and practice across other regions.

5.4 Recommendations

Based on the findings of the study on Mathematics teachers' preparedness in implementing the Namibia Senior Secondary Certificate Advanced Subsidiary (NSSCAS) curriculum, the following recommendations are suggested:

Recommendations for Policy

- The Ministry of Education must ensure that the NSSCAS curriculum is aligned with the required assessments and learning outcomes. Regular reviews and updates of the curriculum should reflect current educational trends and best practices in Mathematics education.
- Stakeholders should inform the Ministry of Education, Arts, and Culture about factors influencing teachers' preparedness and recommend adjustments to subject policies and regulations to better support Mathematics teachers in implementing the NSSCAS curriculum.

Recommendations for the Ministry

- Provide targeted and ongoing professional development programs for Mathematics teachers to enhance their subject knowledge and pedagogical skills related to the NSSCAS curriculum. This can include workshops, seminars, and collaborative learning opportunities.

- Ensure that Mathematics teachers have access to adequate instructional resources, including different variety of textbooks, technology tools, manipulatives, and supplementary materials. Proper resource allocation will support the effective implementation of the NSSCAS curriculum.
- Allocate sufficient time for Mathematics lessons within the school timetable to allow in-depth coverage of the NSSCAS curriculum. This will enable teachers to address the curriculum content effectively and provide opportunities for students to engage in meaningful activities and discussions.
- Establish a system of ongoing support for Mathematics teachers, such as mentorship programs, peer collaboration, and instructional coaching. This support can help teachers navigate challenges, share best practices, and receive feedback to improve their instructional practices.

Recommendations for Teachers

- Actively participate in professional development programs and seek out additional learning opportunities to enhance their understanding and instructional skills related to the NSSCAS curriculum.
- Make effective use of available instructional resources and technology tools to support teaching and learning processes in the classroom.

Recommendations for Further Research

- Conduct longitudinal studies to track the progress and effectiveness of the NSSCAS curriculum implementation over time, identifying any long-term impacts on teacher preparedness and student outcomes.

- Perform comparative studies to evaluate the implementation of the NSSCAS curriculum across different regions or school types, identifying best practices and areas requiring further support.

These recommendations aim to enhance the overall implementation of the NSSCAS curriculum, improve teacher preparedness, and ultimately, elevate student performance in Mathematics.

5.5 Chapter Summary

This Chapter offers a detailed summary of the study's findings, linking them to existing research on Mathematics teachers' preparedness for implementing the NSSCAS curriculum. It underscores the critical role of training, resources, support, and evaluation in achieving effective curriculum implementation and enhancing Mathematics education in Namibia. The recommendations put forth highlight the need for comprehensive and ongoing training, access to relevant resources, supportive school environments, allocated time for planning and preparation, and regular evaluation and feedback. By implementing these recommendations, the MoEAC can enhance Mathematics teachers' preparedness, ultimately leading to improved student learning outcomes and a more robust educational experience in Mathematics at the Advanced Subsidiary level.

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APPENDICES

APPENDIX A: ETHICAL CLEARANCE

UNAM
UNIVERSITY OF NAMIBIA

ETHICAL CLEARANCE CERTIFICATE

Ethical Clearance Reference Number: DEC: HPC00019 **Date: 12 September 2023**

This Ethical Clearance Certificate is issued by the University of Namibia Ethics Committee (REC) in accordance with the University of Namibia's Research Ethics Policy and Guidelines. Ethical approval is given in respect of undertakings contained in the Research Project outlined below. This Certificate is issued on the recommendations of the ethical evaluation done by the ethics committee.

Title of Project: MATHEMATICS TEACHERS' PREPAREDNESS IN IMPLEMENTING THE NAMIBIA SENIOR SECONDARY CERTIFICATE ADVANCED SUBSIDIARY CURRICULUM LEVEL

Student: INAMUTILA KAMBONDE
Student Number: 201409889

Supervisor(s): Dr. LLT Nghipandulwa

Co-Supervisor: Dr. NDEYAPO MUSHAANDJA-MUFETI

Centre for Research Services

Take note of the following:
1. Any significant changes in the conditions or undertakings outlined in the approved Proposal must be communicated to the ethics committee. An application to make amendments may be necessary.
1. Any breaches of ethical undertakings or practices that have an impact on ethical conduct of the research must be reported to the ethics committee
2. The Principal Researcher must report issues of ethical compliance to the ethics committee (through the Chairperson) at the end of the Project or as may be requested by the ethics committee
3. The ethics committee retains the right to:

i) Withdraw or amend this Ethical Clearance if any unethical practices (as outlined in the Research Ethics Policy) have been detected or suspected,
i) Request for an ethical compliance report at any point during the course of the research.

The ethics committee wishes you the best in your research.

Dr Angelina Popyeni Amushigamo (Chairperson DEC HPC)

Prof. Davis Mumbengegwi (Head, Multidisciplinary Research)

APPENDIX B: PERMISSION LETTER FROM THE UNIVERSITY OF NAMIBIA

CENTRE FOR RESEARCH SERVICES
Office of the Pro-Vice Chancellor: Research, Innovation & Development
University of Namibia, Private Bag 13301, Windhoek, Namibia
340 Mandume Ndemufayo Avenue, Pioneers Park, Office F223 - Fblock, Second Floor
☎ +264 61 206 4673; E-mail:kmbulu@unam.na; URL.: http//www.unam.edu.na

UNAM
UNIVERSITY OF NAMIBIA

RESEARCH PERMISSION LETTER

Date: 15/09/2022

Student Name: INAMUTILAKAMBONDE

Student Number: 201409889

Programme: Master of Education

Approved Research Title: Mathematics Teachers' Preparedness in Implementing the Namibia Senior Secondary Certificate Advanced Subsidiary Curriculum Level

TO WHOM IT MAY CONCERN:

I hereby confirm that the above-mentioned student is registered at the University of Namibia for the programme indicated. The proposed study met all the requirements as stipulated in the University guidelines and has been approved by the relevant committees.

The proposal adheres to ethical principles as per attached Ethical Clearance Certificate. Permission is hereby granted to carry out the research as described in the approved proposal.

Best Regards

Dr. AEE Shikongo
Head: Postgraduate Research Support Services
Tel: +264 61 206 3129
E-mail: aeshikongo@unam.na

CENTRE FOR RESEARCH SERVICES
Office of the Director
2023 -09- 15
University of Namibia
UNAM

APPENDIX C: LETTER TO EDUCATION DIRECTOR

P O Box 2644

Ondangwa

18 September 2023

The Director of

Education Ohangwena

Education Directorate

Private Bag 88005

Eenhana

Dear Mr Hamatwi

Request for permission to conduct an educational research study in Ohangwena region on the topicMATHEMATICS TEACHERS' PREPAREDNESS IN IMPLEMENTING THE NAMIBIA SENIOR SECONDARY CERTIFICATE ADVANCED SUBSIDIARY CURRICULUM LEVEL.

I am Inamutila NN Kambonde, a teacher at Mwadikange Kaulinge SS and a part-time student at the University of Namibia, pursuing a Masters' degree in Mathematics Education. In partial fulfilment of the requirements for the completion of this degree, I am required to conduct a researchproject on the topic stated above during the months of September/October 2023.

As part of its education reform programs, the Ministry of Education, Arts, and Culture started with the AS level in 2021 (MoEAC, 2016). The national AS results of the years 2021 and 2022 recorded low academic performance in Mathematics. For instance, Ohangwena region 2022 Mathematics results for AS level indicated a poor performance with an average of 17.0% only (Professional Development Advisory Services, 2023).

Mandukwini (2016) recommended that teachers be consulted to document their experiences implementing new curricula to record challenges and take appropriate measures to address these. It is therefore against this backgroundthat this study aims to explore Mathematics teachers' preparedness for the AS curriculum level implementation, focusing on the seven selected secondary schools in Ohangwena Region.

I am kindly requesting your good office to grant me permission to conduct research in the seven selected secondary schools in Ohangwena Region. The study will be conducted as follow; (a) classroom observation, in which one lesson for Mathematics (AS) will be conducted per school

(b) a focus group discussion of all Mathematics AS teachers per school. Focus group discussion will last for about 20 minutes and will be done after school to avoid lesson disturbance. Observations will be done during school hours and will only take about 40 minutes per participant.

The participants will be informed about the purpose and objectives of the study and how will theybenefit from it. They will also be informed about their right to participate and that they have a rightto withdraw from the study should they feel so. The study will inform the MoEAC withrecommendations for the effectiveness of Mathematics' AS curriculum implementation.

Attached please find a copy of my Ethical clearance certificate as well as the permission letter as granted by UNAM

Looking forward for your good response.

Yours sincerely

Inamutila Kambonde

(0817242197)Email:

shangehk@gmail.com

APPENDIX D: PERMISSION LETTER FROM EDUCATION DIRECTOR

REPUBLIC OF NAMIBIA

OHANGWENA REGIONAL COUNCIL

DIRECTORATE OF EDUCATION, ARTS AND CULTURE

Office of the Director
Tel: (+264) 65 290200
Fax: (+264) 65 290224
Enquiries: Mirjam N N Nambahu
Email: [illegible]
Our Ref: 13/2/9/1

Pandbasie Street, Greenwell Complex Building
Private Bag 88005
EENHANA

25 September 2023

Inamutila Kambonde
PO Box 2644
Ondangwa

SUBJECT: REQUEST FOR PERMISSION TO CONDUCT RESEARCH IN OHANGWENA REGION

1. Receipt of your letter dated 18 September 2023 is hereby acknowledged.
2. Be informed that permission to collect data for research from secondary schools in Ohangwena region has been granted under the following conditions and request:
   - The data to be collected should only be used for the completion of your studies.
   - You have to liaise with the concerned Principals to make prior arrangements before the date of the research.
   - No other data should be collected other than the data of the nature that has been stated in your request.
   - Participation in the study is voluntary and per individual decision.
   - Minors may need parental consent to participate.
   - You may share the final report of your study with the directorate.
3. It is trusted that you will find this arrangement in order while wishing you all the best with your studies.

Yours Sincerely,

25/09/2023

ISAK HAMATWI
DIRECTOR

APPENDIX E: LETTER TO SCHOOL PRINCIPALS

26 September 2023

To: Office of Principal

…………………… Secondary School

Ohangwena region

REQUEST FOR PERMISSION TO CONDUCT RESEARCH ON THE TOPIC:

MATHEMATICS TEACHERS' PREPAREDNESS IN IMPLEMENTING THE NAMIBIA SENIOR SECONDARY CERTIFICATE ADVANCED SUBSIDIARY CURRICULUM LEVEL.

My name is Inamutila NN Kambonde, a Master's student at the University of Namibia, with student number 201409889. I am writing to seek your permission to conduct research at your esteemed school as part of my Master's degree requirements on the aforementioned topic during the month of September and October. The primary objective of the study is to explore the preparedness of Mathematics teachers in implementing the Advanced Subsidiary (AS) level curriculum in five selected secondary schools within the Ohangwena region, including your school.

The study will include focus group discussions and non-participant observation to gather data from Mathematics AS teachers on their experiences, challenges, and strategies in implementing the NSSCAS Mathematics curriculum. . I guarantee that all participants' identities and school information will be kept confidential, and that the data obtained will only be used for academic purposes.

Attached please find a copy of the permission letter from the office of the Director of Education, Ohangwena region. I am available to provide any additional information or clarification if needed.

Yours sincerely,

Inamutila NN Kambonde

Student No: 201409889

0817242197

APPENDIX F: CONSENT FORM FOR TEACHERS

INFORMED CONSENT FOR QUALITATIVE STUDIES

NOTE: All parts in red (including this sentence) are instructions and guidelines to the Investigator to complete this Annex and should be deleted when this form is finalised! No other parts should be deleted.

Informed Consent for: principals, teachers and parents

Name of Principal Investigator:	Ms. Inamutila NN Kambonde
Name of Sponsor:	N/A

This Informed Consent Form has two parts:

• Information Sheet (this section, to share information about the study with you)

• Certificate of Consent (for signatures if you choose to participate)

You will be given a copy of the full Informed Consent Form.

PART I: INFORMATION SHEET

Introduction

I am Inamutila NN Kambonde, a University of Namibia Master student. I am carrying out a study on Mathematics teachers' preparedness in implementing the Namibia Senior Secondary Certificate Advanced Subsidiary curriculum level in five selected Secondary schools in Ohangwena region. I am going to give you information and invite you to be part of this research. You do not have to decide today whether or not you will participate in the research. Before you decide, you can talk to anyone you feel comfortable with about the research. This consent form may contain words that you do not understand. Please ask me to stop as we go through the information and I will take time to explain. If you have questions later, you can ask me.

Purpose of the Research

As part of its education reform programs, the Ministry of Education, Arts, and Culture started with the AS level in 2021 (MoEAC, 2016). The national AS results of the years 2021 and 2022 recorded low academic performance in Mathematics. For instance, Ohangwena region 2022 Mathematics results for AS level indicated a poor performance with an average of 17.0% only (Professional Development Advisory Services , 2023). Mandukwini (2016) recommended that teachers be consulted to document their experiences implementing new curricula to record challenges and take appropriate measures to address these. Since the AS level was only implemented in 2021, there exists limited literature on Mathematics Advanced Subsidiary level experiences in the Namibian context, and hence possible challenges experienced during the implementation are yet to be documented. It is therefore against this background that this study aims to explore Mathematics teachers' preparedness for the AS curriculum level implementation, focusing on the five selected secondary schools in Ohangwena Region.

Type of Research Intervention

This research will involve your participation in a focus group discussion which will last for about 20 minutes and the discussion will be audio recorded. It will also involve observations that will be done during school hours and it will take about 40 minutes.

Participant Selection

You are being invited to take part in this research because I feel that your experience as a Mathematics AS teacher since its inception, you remains the driver of the new curriculum and you may have come across a lot of issues regarding Mathematics teachers 'preparedness on the implementation of AS-level. Simply you are in a good position to review the curriculum compared to others.

Voluntary Participation

Your participation in this research is entirely voluntary. It is your choice whether to participate or not.

Procedures

You are invited to participate in discussions with your other school's other AS teachers. This discussion will be guided by myself (Ms Kambonde). The group discussion will start with me making sure that you are comfortable. The discussion will take place at your school, and no one else but the people who will participate in the discussion and myself will be present during this discussion. The entire discussion will be recorded, but no one will be identified by name on the recording. The recording will be kept safe and locked in a cabinet. The recorded information is confidential, and no one else except the researchers will access the recordings. The recordings will be destroyed after five years.

Duration

The group discussion will takes place for one day and will take about 20 minutes and the classroom observation will also take place the same day and will last for one lesson only.

Risks

There are no risks involved in this study.

Benefits

There will be no direct benefit to you, but your participation is likely to help me explore the Mathematics teacher's preparedness in the implementation of the new curriculum Advanced Subsidiary level (AS).

Reimbursements

You will not be provided any incentive to take part in the research.

Confidentiality

I will not be sharing information about you to anyone outside of the research team. The information that I collect from this research project will be kept private. No names will be written on the instrument, and the names of the schools will not be revealed when reporting the findings of the study. The data collected in this study will be treated with utmost confidentiality as only the researcher and supervisors will have access. Data collected will be kept for a period of three years after the completion of the study and thereafter, destroyed by erasing the hard drive and destroying the hard copies.

Sharing the Results

Nothing that you tell me today will be shared with anybody outside the research team, and nothing will be attributed to you by name.

Right to Refuse or Withdraw

You do not have to take part in this research if you do not wish to do so, and choosing to participate will not affect your job or job-related evaluations in any way. You may stop participating in the group discussion at any time that you wish without your job being affected. I will give you an opportunity at the end of the discussion to review your remarks, and you can ask to modify or remove portions of those, if you do not agree with my notes or if I did not understand you correctly.

Who to Contact

If you have any questions, you can ask them now or later. If you wish to ask questions later, you may contact Inamutila NN Kambonde, P O Box 2644, Ondangwa, 081 7242197, email: shangehk@gmail.com

This research has been reviewed and approved by the relevant Ethics Review Committee at the University of Namibia, which is a committee whose task it is to make sure that research participants are protected from harm. The committee reports to the University's Centre for Research Services.

You can ask me any questions about any part of the research study if you wish to. Do you have any questions?

PART II: CERTIFICATE OF CONSENT

I have been invited to participate in research about exploring the Mathematics teacher's preparedness in the implementation of the new curriculum Advanced Subsidiary level (AS) in five selected secondary schools of the Ohangwena region.

This section is mandatory

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have been asked, have been answered to my satisfaction. I consent voluntarily to be a participant in this study

…………………………………………………. ………………………………….

Name of Participant (print) Signature of Participant

………………………………

Date (day/month/year)

APPENDIX G: FOCUS GROUP DISSCUSSION GUIDE

TEACHER'S INTERVIEW GUIDE

My name is Inamutila NN Kambonde, student no: 201409889 and a Master's student at the University of Namibia. I am conducting a research on Mathematics teacher's preparedness in implementing the NSSCAS curriculum level. The main research objective of this study is to explore the Mathematics teacher's preparedness in the implementation of the Advanced Subsidiary level (AS) curriculum in five selected secondary schools of the Ohangwena region. The interview will take about 20 minutes and a voice recorder will be used to record the focus group proceedings for analysis. I am therefore requesting you to feel free when answering the interview questions. This research is for academic purposes and all the information that will be revealed here will be treated confidentially.

<u>SECTION A: DEMOGRAPHIC INFORMATION</u>

Tick the appropriate box

1. What is your gender?

Female ☐ Male ☐

2. Your age group

23 – 25 Years ☐ 26 -20 Years ☐ 31 – 35 Years ☐ 36+ Years ☐

3. What's your teaching experience?

1-5 Years ☐ 6-10 Years ☐ 11+ Years ☐

<u>SECTION B: STRUCTURED QUESTIONS</u>

Interview Questions

1) How is the Mathematics teachers' preparedness regarding the implementation of the Mathematics NSSSCAS level?

(i) I would like to hear your thoughts on the new curriculum and how you feel about its implementation

(ii) How do you understand “Mathematics teachers’ preparedness in implementing the Mathematics NSSCAS curriculum level”?

(iii) Were you consulted to take part in the drafting of Mathematics AS syllabus?

(iv) Do you think you were prepared for Mathematics NSSCAS level curriculum? If yes, can you please give a brief explanation on how you were prepared for the implementation of Mathematics AS level?

(v) How familiar are you with the curriculum changes associated with NSSCAS?

(vi) Have you received any training or professional development related to Mathematics NSSCAS implementation? If so, what topics were covered and how have you applied that knowledge in your teaching? If no, how are you coping?

(vii) In what way does your Subject Advisory/ HOD monitor your teaching and assessment exercises and do they offer support and mentoring when necessary?

(viii) What are your thoughts on the time allocated for the completion of Mathematics AS syllabus?

2. What do you think are the factors that influence your effective preparedness as a Mathematics teacher in implementing the AS level?

    (i) What are the necessary resources needed for the effective implementation of Mathematics AS level? And are they all available at your school?

    (ii) What steps have you taken to familiarize yourself with the curriculum requirements and guidelines for teaching Mathematics at the NSSCAS level?

    (iii) What teaching approaches do you use to accommodate students with varying abilities and learning styles in the NSSCAS classroom?

    (iv) As a Mathematics teacher, do you think the NSSCAS curriculum started at the right time? Explain

3. What strategies can be implemented to ensure that teachers are prepared to implement the Advanced Subsidiary curriculum level?

(i) What do you think can be done to prepare Mathematics teachers for any future implementation of new curriculum in schools?
(ii) Is there any other information that you want to add?

APPENDIX H: OBSERVATION GUIDE

Observation schedule guide

Name of School:……………………………………Date of Observation:……………..

Subject…………………………………………………Class………..

Lesson Topic:………………………………………..No. of Learners:………...

Observation criteria	Comments
1. Lesson planning and preparations i. The lesson plans are clearly based on the basic competencies and learning objectives in the syllabus. ii. The lesson plans contain all the necessary components (e.g. introduction, presentation, learner work, teaching aids, assessment, conclusion, homework, compensatory teaching, etc.). iii. The lesson plans are connected to a scheme of work and a year plan that is based on the NSSCAS syllabus.	
2. Lesson introduction i. Highlights and feedback of the previous homework is done properly. ii. Gained immediate interest of the learners iii. The lesson introduction linked new subject matter to previous lesson and prior knowledge iv. Learning outcomes was made clear	
3. Lesson Presentation i. Repeated the main questions to be addressed ii. Subject content and learning tasks presented in a clear and stimulating manner. iii. The teacher communicates clearly and effectively with learners through questioning, instruction, explaining and feedback iv. Continuously monitored learners' attention v. Demonstrated good questioning skills vi. Included open/higher level type of questions vii. The teacher gives individual/ pair work/ group activities/ tasks.	

viii. The teacher gives clear instructions and guidance for activities and assignments. ix. The teacher gives frequent, supportive, and appropriate feedback on responses by learners (oral and written).	
4. Subject Knowledge i. Demonstrated an understanding of subject knowledge ii. Responds confidently to learners inquiries about course content iii. Is able to admit error and/or insufficient knowledge	
5. Teaching and learning media Note if the teacher uses textbooks, supplementary materials, technology, or other resources for teaching NSSCAS Mathematics concepts.	
6. Assessment and closure i. Assessment activities are clearly related to the lesson objective/basic competencies covered in today's lesson. ii. Assessed learners' levels of understanding continuously via oral, written or practical work iii. Provided exercises for practice/ homework given iv. Summarised the main ideas and gave conclusion	
7. Classroom Management Observe the teacher's ability to manage the class, handle disruptions, and maintain an inclusive learning environment	

APPENDIX I: DOCUMENT ANALYSIS GUIDE

Document analysis guide

Subject:…………………………………..................................Date…………………..

Document selected	Data to be analysed
1. Policy documents Review official government policies or guidelines related to the implementation of the NSSCAS level curriculum in Mathematics education to gain insights into the expectations, guidelines, and support mechanisms provided to Mathematics teachers in preparation for the implementation of the NSSCAS Mathematics curriculum. It may also contribute to understanding the preparedness of Mathematics teachers and provide a foundation for further research and analysis. This may include the National Curriculum for Basic Education (2016), curriculum frameworks, or subject-specific policy.	• Guidelines on the implementation of Mathematics NSSCSAS level. • Training and support provided to Mathematics by the MoEAC
2. Curriculum documents: Analyze the Mathematics curriculum documents specific to the NSSCAS level. This could involve studying curriculum guides, syllabi, or instructional materials provided to teachers to obtain the learning outcomes, objectives, and content standards set by the government for Mathematics at the NSSCAS level.	Identify: • The learning outcomes and objectives • Content standard • Support material and approved textbooks

3. Evaluation and assessment materials Analyze materials related to the evaluation and assessment of Mathematics teachers' performance or students' achievement in the NSSCAS level curriculum. This may include assessment frameworks, sample assessments, or examiner’s report. These reports may provide insights into the challenges, successes, or recommendations related to teachers' preparedness.	• Evaluate the candidate performance objectively • Area of improvement