

## Investigating Mathematics Teachers' Preparedness in Implementing the Namibia Senior Secondary Certificate Advanced Subsidiary Curriculum

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**[Abstract]** Since Namibia's independence in 1990, the education system has experienced substantial reforms, notably the introduction of the Namibia Senior Secondary Certificate Advanced Subsidiary (NSSCAS) curriculum in 2021. Notwithstanding these reforms, Mathematics performance in the Ohangwena region continues to be markedly inadequate. This study examined the readiness of Advanced Subsidiary (AS) Mathematics educators to implement the NSSCAS curriculum in five selected secondary schools in the Ohangwena region, concentrating on the research question: How are the mathematics teachers prepared for the implementation of the Advanced Subsidiary Level Mathematics curriculum? The study employed a qualitative research methodology utilizing a descriptive case study design, incorporating a focus group discussion with 16 participants.

The findings indicated that, while teachers possess a fundamental comprehension of the NSSCAS curriculum, they face considerable obstacles including inadequate training, insufficient teaching tools, restricted lesson time, and a deficiency in ongoing professional development. The report advocates for extensive training programs, enhanced resource distribution, curriculum modifications to align session duration with curriculum requirements, and the creation of a strong monitoring and assessment framework. These recommendations are essential for augmenting teacher preparedness, facilitating the effective execution of the NSSCAS Mathematics curriculum, and elevating the quality of Mathematics education and student learning results.

**[Keywords]** mathematics teachers, preparedness, curriculum, implementation, NSSCAS, secondary education

### Background Of The Study

Education is regarded as a catalyst for the social and economic advancement of any nation, equipping students to fulfil the increasing demand for higher education and employment prospects in the 21st century (Chemagosi, 2020). Since achieving political independence from South African colonial authority in 1990, the Namibian education system has experienced extensive improvements, chiefly through curriculum evaluations (Ministry of Education, Arts, and Culture [MoEAC], 2016). The last assessment took place in 2013, according to a Cabinet decision that addressed a resolution from the 2011 National Education Conference, with the objective of realigning the education system to the long-term goals specified in Namibia Vision 2030 (MoEAC, 2016).

The Ministry of Education, Arts and Culture's (MoEAC) concerns in 2012-2013 over insufficient training and unmet objectives prompted the introduction of a redesigned curriculum in 2015 (National Institute for Educational Development (NIED), 2020). The recent basic education reform included the Namibian Senior Secondary Certificate Advanced Subsidiary (NSSCAS) course, equal to the Cambridge Advanced Subsidiary (CAS), adopted in 2021. Mathematics is a fundamental discipline at the Advanced Subsidiary (AS) level, since it provides students with the skills, information, concepts, and processes necessary to investigate and analyse numerical and spatial relationships and patterns in the environment. Nonetheless, the NSSCAS Mathematics scores for 2021 and 2022 revealed a nationwide trend of subpar academic achievement (DNEA, 2021; 2022). Consequently, this motivated the researchers to conduct a study aimed at examining Mathematics teachers' readiness for the implementation of the Mathematics Advanced Subsidiary level (NSSCAS).

Mathematics is a pivotal subject at the Advanced Subsidiary (AS) level, as it provides learners with the skills, knowledge, concepts, and processes essential for exploring, modelling, and interpreting numerical and spatial relationships and patterns in the world. The National Institute for Educational Development (NIED) (2016) asserts that mathematics is an essential instrument for daily life and is fundamental to the progress of science, technology, and business. Nevertheless, the NSSCAS mathematics outcomes for 2021 and 2022 revealed a national pattern of subpar academic achievement (MoEAC:DNEA, 2021; 2022). This motivated the researchers to conduct a study targeted at examining mathematics teachers' readiness for the introduction of the mathematics Advanced Subsidiary level (NSSCAS).

### ***Problem Statement***

The Ministry of Education, Arts, and Culture (MoEAC) established the Namibia Senior Secondary Certificate Advanced Subsidiary (NSSCAS) level in 2021 as a component of its education reform initiative, designed to enhance educational quality and ensure greater alignment with international standards (MoEAC, 2016). The NSSCAS curriculum is structured to deliver an advanced level of subject knowledge, equipping learners for higher education or specialised disciplines. However, its implementation has underscored numerous challenges, especially in mathematics, where the outcomes in the Ohangwena region exposed notable difficulties. The average performance in mathematics was 30.8% in 2021 and declined further to 17.0% in 2022, indicating a troubling trend in learners achievement (Professional Development Advisory Services, 2023).

The decrease in performance indicates possible deficiencies in the readiness of mathematics teachers, a crucial element for the efficient implementation of the NSSCAS curriculum. The capacity of educators to navigate the intricacies of the curriculum, along with their willingness to implement sophisticated pedagogical techniques and evaluative approaches, profoundly influences student learning results. Nonetheless, in the absence of sufficient professional development support, numerous teachers encounter challenges in adjusting to the new norms and expectations. The efficacy of NSSCAS implementation in mathematics is directly linked to the extent of investment in continuous teacher training and resource allocation. Due to the AS level's implementation in 2021, there is a paucity of material regarding mathematics Advanced Subsidiary level experiences in Namibia; hence, the potential obstacles encountered during implementation remain undocumented. This research aims to investigate mathematics

teachers' readiness for the implementation of the AS curriculum, concentrating on five selected secondary schools in the Ohangwena Region.

### ***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 question: ***How prepared are the mathematics teachers regarding the implementation of the mathematics Advanced Subsidiary level?***

### ***Significance of the Study***

The study may offer the MoEAC recommendations for the effective readiness of mathematics AS instructors for AS curriculum implementation. By acquiring a comprehensive understanding of teachers' readiness to implement the AS Mathematics curriculum, innovative strategies can be formulated for the Ministry of Education, Arts, and Culture (MoEAC) to modify existing subject policies and regulations, thus enhancing the efficacy of AS level implementation. Furthermore, AS Mathematics teachers can leverage the research findings to appraise their performance, pinpointing strengths and weaknesses to serve as a foundation for their professional development and enhancement.

### ***Theoretical Framework***

This research is guided by the Practical Theory of Teaching, as articulated by Handal and Lauvas (1987). This approach underscores that effective classroom instruction depends on a teacher's readiness, influenced by their values, beliefs, knowledge, professional identity, and classroom practices. Handal and Lauvas (1987) assert that instructors' preparation encompasses not only their academic knowledge but also the actual application of this information in educational contexts.

The Practical Theory of Teaching posits that educators include a pragmatic aspect into their education, defined by their capacity to amalgamate their values, beliefs, and experiences into their pedagogical methods (Rajagopalan, 2019). This approach emphasizes the imperative for teachers to have both theoretical understanding and practical experience to be effective. It asserts that educators must perpetually refine and utilize their practical ideas to properly adapt to and implement updated curricula (Rajagopalan, 2019).

This study utilizes the Practical Theory of Teaching as a framework to examine mathematics teachers' readiness to apply the new NSSCAS curriculum. The study is shaped by examining how teachers' personal and professional traits, including their values, skills, and knowledge, influence their preparedness to effectively deliver the curriculum. The theory asserts that effective curriculum implementation depends on learners possessing the requisite abilities, knowledge, and values. This study employs the Practical Theory of Teaching to assess the preparedness of mathematics teachers and to discover the elements that affect their readiness. It also aids in comprehending the alignment between teachers' opinions of their preparedness and their actual teaching competencies, as well as the requirements of the NSSCAS program.

### Literature Review

Phelokazi (2013) underscored that teachers are essential facilitators of educational reform and serve a pivotal role as curriculum mediators. Fullan (2001) emphasises the significance of teachers as pivotal change agents, asserting that they hold primary accountability for the effective execution of a new curriculum. Teachers serve as pivotal change agents in educational reform, acting as vital intermediaries of the curriculum (Phelokazi, 2013). Teachers are pivotal in executing reforms and are accountable for the effective incorporation of new curricular initiatives (Fullan, 2001). In Angula's (2015) study, mathematics teachers observed that curriculum developers concentrate exclusively on revisions, neglecting implementation and failing to address the challenges faced by teachers and students with the reformed material. This lapse in the implementation process can substantially impact the efficacy of the curriculum. If implementation is not adequately attended to, the revised curriculum's goals and objectives may remain unfulfilled.

The research by Moses et al. (2024) highlights the apprehensions expressed by mathematics teachers over the insufficient support and follow-up from curriculum developers in relation to the execution of curriculum modifications. Mathematics teachers believe that although curriculum modifications are implemented, there is inadequate focus on their execution in the classroom, resulting in challenges for both teachers and students in adapting.

Angula (2015) indicates that mathematics teachers voice apprehensions over the duration assigned to mathematics lessons in the timetable. It is said that the duration allotted for these classes is frequently inadequate, with the majority being limited to only 45 minutes. This restricted time period can hinder effective instruction and comprehension in mathematics. The data substantiates the idea that the length of teaching time can influence student progress. Tibane et al. (2023) identified a positive link between extended teaching time and enhanced student performance in mathematics. Increased time allocated to mathematics sessions enables teachers to address the content more thoroughly, facilitates richer learning experiences for students, and allows sufficient time for practice and consolidation.

Mandukwini (2016) underscores that the insufficient availability of critical resources substantially impacts the execution of curricular modifications. The deficiency of essential resources in Namibian schools poses a significant obstacle for mathematics teachers, impeding the successful execution of curricular modifications. Supplying essential tools and resources is vital for educators to effectively prepare and focus on instructing their students. Moore (2014) underscores that when teachers possess necessary resources, they may dedicate their time and effort to planning and delivering instruction, rather than expending important time seeking for unavailable materials. The availability of resources allows educators to develop compelling learning experiences, establish suitable evaluations, and equip students with essential tools to investigate and comprehend the new curricular content.

Angula (2015) asserts that teachers necessitate training to proficiently comprehend and execute the curriculum. Inadequate training may hinder teachers' ability to interpret and deliver curriculum content, resulting in inefficient instruction and diminished student progress. Phelokazi (2013) posits that utilizing well-trained personnel, particularly teachers with instructional experience, might alleviate uncertainty and stress during curriculum execution. Teachers who have undergone specialized training pertinent to the curriculum possess a superior comprehension of its

aims, content, and instructional methodologies. This allows them to design and implement education that aligns with the curriculum's objectives and addresses the needs of their pupils

## **Methodology**

### ***Research Design***

The research employed a qualitative methodology including a descriptive case study design. A qualitative research technique is an interpretive methodology designed to investigate and comprehend human experiences, behaviors, and views within their natural environments (Creswell 2021). In contrast to quantitative research, which prioritizes numerical data and statistical analysis, qualitative research highlights rich, descriptive data, facilitating a nuanced comprehension of intricate social processes.

This study employed a qualitative method, allowing participants to provide detailed accounts of their experiences and the difficulties encountered in implementing the mathematics NSSCAS curriculum. This method facilitated an extensive examination of teachers' readiness, including insights into their personal perceptions, challenges, and adaptive techniques. The qualitative method of semi-structured focus group discussions enabled a comprehensive exploration of the intricacies of curriculum implementation, producing significant data that could be overlooked in a solely quantitative analysis (Merriam & Tisdell, 2016).

A descriptive case study is a qualitative design intended to delineate and summarize features, behaviors, or variables of interest within a population or sample (Bhandari, 2020). The descriptive case study design is most appropriate for this research, since it facilitates a thorough, contextually aware examination of mathematics teachers' readiness to execute the NSSCAS Mathematics curriculum. This design was most suitable for the study, as it concentrated on examining mathematics teachers' readiness to apply the Advanced Subsidiary (AS) level curriculum.

### ***Population***

The main aim of this study was to examine the preparation of mathematics teachers for the AS-level Mathematics curriculum, focusing on a specific group of 25 AS Mathematics teachers from 11 secondary schools in the Ohangwena region that provide the AS level curriculum.

### ***Sample and Sampling Procedures***

The researcher employed purposive sampling to identify five (5) secondary schools that were early adopters of the AS-level Mathematics curriculum. This choice was made to obtain views from teachers with direct, initial experiences in implementing the new curriculum, who are likely to provide valuable perspectives on the problems and techniques associated with adjusting to the AS-level content (Patton, 2015). The five schools were deliberately selected as they were among the first in the region to adopt the Mathematics AS-level curriculum since its introduction in 2021. The study aims to obtain significant insights from teachers with direct experience in implementing the AS-level Mathematics program by selecting schools that were leaders in the curriculum rollout. Each chosen school employs between two and five AS mathematics teachers.

All 16 Mathematics AS-level teachers from the five intentionally selected secondary schools engaged in a focus group session. The deliberate selection of the 16 AS Mathematics

teachers was based on their experience of teaching mathematics at the AS level for two or three years, designating them as pioneers likely to have faced and resolved numerous issues specific to the early implementation phase.

### ***Data Collection Tools***

This study utilized a single research tool to collect data, which was a focus group discussion guide. Focus group discussions (FGDs) are a qualitative data collection technique that assembles a small cohort of participants to deliberate about a specific subject under the guidance of a facilitator. This methodology allows the researcher to obtain comprehensive insights into participants' attitudes, opinions, and experiences, while promoting group interaction that may yield more substantial data than individual interviews (Krueger & Casey, 2015).

A focus group interview guide, with semi-structured open-ended questions, was developed to promote comprehensive discussions and obtain specific views into mathematics instructors' readiness to implement the NSSCAS curriculum. The focus group method was chosen since it allowed the researcher to comprehensively investigate participants' thoughts, experiences, and views, so offering a detailed insight into the obstacles and strategies related to curriculum implementation. The focus group discussion, comprising 16 AS-level Mathematics instructors, facilitated the exchange of varied viewpoints and experiences, aiding in the identification of common themes and distinctive insights that may not surface in individual interviews.

The interactive platform facilitated collaborative discourse, allowing teachers to enhance each other's comments and resulting in deeper observations and more nuanced insights. The open-ended questions enabled the researcher to acquire a comprehensive grasp of the requisite methodologies for equipping mathematics teachers for the execution of the NSSCAS Mathematics curriculum. Sixteen AS-level Mathematics educators engaged in the focus group discussion. A voice recorder was employed to document the focus group discussions for data analysis.

### ***Data Collection Procedures***

The researcher secured an ethical clearance certificate from the University of Namibia Decentralized Ethics Committee (DEC) and obtained permission from the Regional Directorate of Education, Arts and Culture, along with consent from the principals of selected secondary schools, to conduct the study in the Ohangwena region. Five focus group sessions were held with 16 Mathematics AS-level instructors, each lasting approximately 30 minutes and planned after school hours to prevent disruption of lessons. The educators were arranged into five focus interview groups, labelled Group A, Group B, Group C, Group D, and Group E, with each group consisting of participants numbered one to five.

### ***Data Analysis***

The thematic analysis approach was employed to examine the data gathered in this study. The procedure entailed transcribing the recorded chats and methodically analyzing them to discern and categorize significant units of information. The portions were subsequently tagged and categorized, facilitating the emergence of principal themes. The thematic analysis yielded profound insights by uncovering patterns among the data, so enhancing the comprehension of teachers' readiness and classroom practices.

### ***Ethical Considerations***

The ethical clearance certificate was acquired by the University of Namibia Decentralized Ethics Committee (DEC). The researcher utilized this certificate to request a research permission letter from the Centre for Research Services at UNAM to carry out the investigation. An official authorization letter was subsequently obtained from the Regional Directorate of Ohangwena Region to conduct the study inside the area. Each selected secondary school administrator was contacted for re-arrangement via a permission letter. The researcher acquired the participant's consent via a consent letter. Participants were apprised of their ability to withdraw from the study at any moment should they experience discomfort.

To maintain secrecy, no names were documented on the research instruments, and the identities of the schools were not revealed in the study's results. The obtained data were handled with the highest level of secrecy, with access restricted to the researcher and supervisors. The gathered data will be safely retained for three years' post-study completion, after which it will be obliterated by wiping the hard drive and discarding any physical copies.

### **Presentation And Discussion of Findings**

This section delineates the outcomes of the research study that investigated the readiness of mathematics teachers to apply the AS-level curriculum in five selected secondary schools within the Ohangwena region. The study examined a meticulously chosen sample that reflects the larger population, offering insights into the general preparedness of mathematics instructors for curriculum implementation. A comprehensive analysis and discourse on the results, highlighting the three principal themes and patterns that surfaced from the data is provided. The data obtained from the focus group interviews are presented and examined. The results are qualitatively consistent with the study's aims and research questions, classified into three themes: 1) The aim of the NSSCAS curriculum, 2) The level of teachers' readiness in implementing the NSSCAS curriculum, and 3) The factors influencing effective preparedness for NSSCAS curriculum implementation.

#### ***The Aim of the NSSCAS Curriculum***

This subsection presents a comprehensive review of educators' perspectives on the primary objective of the NSSCAS program. The participants expressed their opinions on the effectiveness of the AS-level curriculum's objectives. The subsequent replies were collected from participants in various focus groups.

Participant 1 Group A: *“The objective of the AS level is commendable as it aids in bridging the gap between grade 12 mathematics and university mathematics entry courses, given that most grade 12 NSSCO learners from the previous curriculum struggled to manage first-year university mathematics.”*

Participant 2 Group B: *“I contend that the objective of the AS level is advantageous as it furnishes students with a robust foundation in their selected subjects. It aids in the development of critical skills and information beneficial for both higher education and future careers.”*

Instructor 3 Group C: *“In my view, the objective of the AS level is praiseworthy as it enables students to investigate various disciplines and make informed choices regarding their future educational trajectories.”*

Participant 4 Group D: *“The objective of the NSSCAS level is clear and it introduced more sophisticated content relative to the previous curriculum.”*

Participant 5 Group E: *“I contend that NSSCAS was designed to cultivate knowledge and promote critical thinking.”*

The responses underscore the efficacy of the AS level in connecting grade 12 mathematics with university entry courses, indicating that the AS level curriculum offers a robust foundation for learners. The program equips learners with fundamental skills and information for advanced study and prospective careers. The curriculum provides students with the opportunity to investigate many disciplines, facilitating informed judgements regarding their academic and professional trajectories.

These results correspond with a study conducted by Tibane et al. (2023). It was discovered that when curriculum is adjusted with sufficient support and training for teachers, they are more capable of comprehending and effectively delivering the new material. This assistance results in heightened student engagement, enhanced learning outcomes, and the attainment of specified educational objectives.

Participants concur that the AS level curriculum markedly improves learners' preparedness for the demands of university mathematics and other disciplines. This enhancement in readiness is essential for their success in higher education. The curriculum's holistic approach facilitates the transition from secondary to postsecondary education while enhancing general educational growth through the cultivation of critical thinking and a profound comprehension of subjects.

Additionally, five participants noted that the AS level's focus on advanced material and critical thinking corresponds with contemporary educational goals, striving to cultivate well-rounded, analytical graduates. The AS level enhances academic and professional achievement by providing learners with essential skills and knowledge, so serving as a significant component of the educational system. The findings are corroborated by research from Mulenga (2015) and Mandukwini (2016), which underscore the necessity of continual curriculum assessment and enhancement to meet the changing requirements of learners and the expectations of higher education.

This indicates that the AS level affects learners' academic decision-making processes. Phelokazi (2013) underscores that teachers are essential in educational change, serving as vital intermediaries of the curriculum. Teachers serve as important change agents in executing educational changes and facilitating curricular integration (Phelokazi, 2013).

### ***AS Mathematics Teachers' Views on their Preparedness for this Implementation of the Mathematics NSSCAS Curriculum***

This section examines AS Mathematics teachers' views on their readiness to execute the Namibia Senior Secondary Certificate Advanced Subsidiary (NSSCAS) curriculum. The insights collected emphasize teachers' comprehension of the curriculum's objectives, their preparedness to

implement its content and approaches, and the obstacles they encounter. To examine the level of teachers' readiness in the implementation of NSSCAS curriculum, the participants were requested to provide their opinions regarding mathematics teachers' readiness to apply the NSSCAS Mathematics curriculum. The following are responses from six participants in various focus groups.

Participant 1 (Group A): *“I was prepared; I had been instructing advanced mathematics under the previous curriculum and reviewing the syllabus, which appeared to be manageable to me.”*

Participant 2 (Group B): *“As a mathematics teacher, I felt sufficiently equipped to execute the Mathematics NSSCAS curriculum level. I participated in professional development programs and workshops aimed at acclimating teachers to the new curriculum. These seminars imparted a profound comprehension of the topic, pedagogical approaches, and evaluative techniques consistent with the new curriculum.”*

Participant 3 (Group C): *“I deemed the preparation for the implementation of the Mathematics NSSCAS curriculum level to be thorough and beneficial. Our school conducted training sessions that addressed the essential elements of the new curriculum, encompassing modifications in content, pedagogical approaches, and evaluation methods.”*

Participant 4 (Group D): *“I possess ambivalent sentiments regarding the preparation for the implementation of the Mathematics NSSCAS curriculum level. Although I have participated in several professional development courses, I am unsure about specific elements of the new curriculum. I recognize that I require more training and support to effectively teach the material and implement the suggested pedagogical practices.”*

Participant 4 (Group E): *“Honestly, I do not feel prepared to implement the Mathematics NSSCAS curriculum level. I have not undergone any targeted training or professional development concerning the new curriculum. I am apprehensive regarding my capacity to proficiently deliver the subject and fulfil the curriculum's requirements.”*

Participant 3 (Group D): *“I have not received adequate preparation for the implementation of the Mathematics NSSCAS curriculum level. There have been cursory conversations in staff meetings, but no specialized training or seminars have occurred. I require additional advice and tools to comprehend the changes and adjust my teaching accordingly.”*

These replies demonstrate significant variability in teachers' degrees of readiness. While some have benefited from extensive professional growth and support, others feel inadequately equipped due to poor training and resources. This difference reveals a significant disparity in professional preparedness, emphasizing the necessity for more uniform and equitable training options. This gap

highlights the necessity for more uniform and thorough professional development opportunities to guarantee that all educators feel assured and sufficiently equipped to implement the new curriculum effectively.

The importance of professional development in preparing educators for changing curriculum is well-established. These findings correspond with research indicating that extensive professional development programs improve instructors' comprehension of new information, pedagogical approaches, and assessment techniques, resulting in more successful curriculum execution (Martinez, 2022; Mulenga, 2015). This underscores the importance of specialized training in preparing educators with essential skills and knowledge.

The supplementary responses offer a more equitable perspective on the participants' preparedness to execute the Mathematics NSSCAS curriculum. The responses indicate a range of readiness among the participants. Despite attending professional development events, some individuals remain hesitant and recognize the necessity for additional training and support. Several participants candidly admitted to feeling inadequately prepared due to a lack of targeted training and professional development concerning the program. A consensus exists regarding the necessity for supplementary guidance and resources to apply the curriculum effectively. These findings align with the existing literature, which emphasizes the significance of thorough professional development for educators. Moses et al. (2024) assert that effective professional development must be ongoing, collaborative, and centered on content-specific pedagogy. This corroborates the participants' feedback that continuous training and support are vital for successful curriculum implementation.

The responses indicate a disparity in participants' readiness to apply for the Mathematics NSSCAS program. While some individuals feel adequately taught and equipped, others convey ambiguity or a lack of readiness, underscoring the necessity for thorough training and assistance to guarantee successful implementation. These findings corroborate existing literature regarding the necessity of sufficient preparation and support for educators throughout the implementation of new curriculum. Mulkeen (2021) contends that successful curriculum implementation necessitates that educators are adequately trained, motivated, committed, and professionally proficient. Effective training equips educators with critical pedagogical skills, topic expertise, and evaluation methodologies crucial for the successful delivery of the curriculum (Moore, 2014).

Participants' responses and literature underscore the necessity for ongoing and focused professional development. Tibane et al. (2023) emphasized that professional development should be continuous and integrated within the educational context, reinforcing the notion that initial training sessions are insufficient without sustained support and resources.

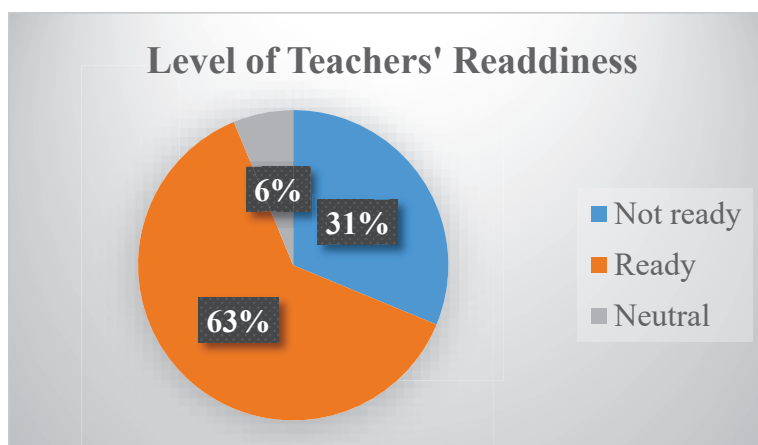
Nevertheless, certain discrepancies noted in the literature were not acknowledged by the participants. Moses et al. (2024) examine the function of professional learning communities (PLCs) in facilitating teachers' professional development. This implies a supplementary method for improving support systems that was not explicitly articulated by the participants but may prove advantageous.

Sixty-three percent of the participants felt equipped to execute the Mathematics NSSCAS curriculum level (Fig.4). The results indicate that teachers possess past experience, have read the syllabus, and have undergone extensive training through their institutions, professional development programs, or workshops. This reflects the teachers' assurance and preparedness to

implement the new curriculum. Conversely, 6% of the participants conveyed neutral sentiments, suggesting ambiguity or a requirement for additional training and support. The teachers have participated in professional development workshops but may necessitate further support and resources. Furthermore, 31% of the participants indicated that they felt insufficiently equipped to execute the curriculum. They indicated an absence of targeted training or professional development for the new curriculum, highlighting the necessity for more comprehensive preparation.

**Figure 1**

*Level of Teachers' Readiness*



These findings correspond with Johannes's (2021) study, which showed that continuous professional development is essential for sustaining and improving teachers' proficiency in curriculum implementation. Continuous training ensures that educators possess the latest pedagogical skills and knowledge, essential for the efficient delivery of the curriculum. Isaias et al. (2020) underscore the importance of ongoing training and assistance for teachers to adjust to changing educational methodologies and effectively execute curricular modifications. Professional development options equip teachers with current information, pedagogical strategies, and tools to integrate their education with evolving curricular standards.

The research conducted by Jentsch and König (2022) and Isaias et al. (2020) corroborate the participants' comments by underscoring the imperative of continuous professional development. They emphasize that although a majority of educators may perceive themselves as prepared, a substantial segment necessitates further assistance and training to attain equivalent preparation. This holistic strategy for professional development is essential for guaranteeing that all educators are adequately equipped to administer the Mathematics NSSCAS curriculum proficiently.

### ***Factors that Influence Effective Preparedness of NSSCAS Curriculum Implementation***

This segment presents a comprehensive review of teachers' perspectives on the elements affecting effective preparedness for the implementation of the NSSCAS curriculum. The participants were

requested to identify variables affecting the effective preparedness for the implementation of the Mathematics NSSCAS curriculum. The subsequent responses were submitted by participants from various focus groups.

Participant 1 (Group A): *“In all honesty, our country required this type of curriculum in light of global educational trends, job market relevance, and alignment with international standards; however, I believe the implementation has not occurred at an opportune moment.”*

Participant 2 (Group B): *“A key factor affecting the effective implementation of the NSSCAS curriculum is the availability of resources. To effectively apply the curriculum, teachers require access to current textbooks, instructional materials, and technology tools. Our school has encountered resource limitations, which have impeded the effective execution of the program. Insufficient resources hinder teachers' ability to provide the curriculum content in an engaging and effective manner.”*

Participant 3 (Group D): *“Although the new curriculum introduces modifications and enhancements to teaching methodologies and content, numerous teachers have not undergone adequate training to adjust to these alterations. This deficiency in training impedes their capacity to proficiently instruct the new curriculum and meet the educational requirements of the students.”*

Participant 4 (Group D): *“The backing from school administration is essential for the effective execution of the curriculum. Active involvement and support from school leaders enhances teachers' confidence and motivation.”*

Participant 2 (Group E): *“The workload of teachers is another critical factor. Teachers are required to swiftly adjust to the new curriculum while concurrently fulfilling their current obligations.”*

The effective preparedness for implementing the Mathematics NSSCAS curriculum is determined by various interconnected aspects, including timing, resources, training, administrative support, and workload. Thoroughly addressing these concerns can improve teachers' preparedness and capacity to effectively administer the curriculum. This necessitates strategic planning, sufficient resource allocation, ongoing professional development, robust leadership, and feasible workloads for educators. By addressing these variables, educational institutions can cultivate a climate conducive to effective curriculum implementation, hence improving educational outcomes for students. Prematurely introducing a curriculum or doing so without sufficient preparation time can undermine its efficacy. These findings are corroborated by Nyamida (2020) who underscores that modifications to the curriculum must be appropriately timed to facilitate adequate teacher preparation and adaptation. Facilitating optimal timing can augment educators' preparedness and assurance in implementing the new curriculum. The accessibility of resources is essential for successful curriculum execution.

These results correspond with Isaias et al. (2020). They emphasize that sufficient resources, including current textbooks and technology tools, are essential for educators to

successfully convey curriculum knowledge. Resource limitations can impede teachers' capacity to engage pupils and deliver high-quality education. It is imperative that schools are adequately supplied with needed resources for effective curriculum execution.

The conclusions derived from the participants' comments concerning elements that affect the effective implementation of the NSSCAS curriculum emphasize the significance of supporting leadership and the necessity of managing teacher workload during the introduction of a new curriculum. Successful implementation necessitates robust administrative backing, with strategies to reduce teacher strain and guarantee that educators possess the time and resources essential for effectively adapting to curricular modifications.

The findings are supported by a study conducted by Tibane et al. (2023), which revealed that an excessive workload might substantially hinder instructors' capacity to properly integrate new curricula. Overburdened educators possess diminished time for planning, collaboration, and the implementation of innovative instructional practices, adversely affecting student learning outcomes. Strategic planning and support to address workload difficulties can improve teachers' preparedness and efficacy in curriculum delivery.

According to Nakanyala's study (2020), incorporating new content into the curriculum can present challenges for educators familiar with the prior edition. These teachers may be unfamiliar with the new subjects and may not have had sufficient training or resources to teach them successfully. Consequently, they may encounter difficulties comprehending the material and face challenges in conveying it to their students.

Consistent with Nakanyala's (2020) findings, Ngema's (2016) study revealed that teachers may encounter feelings of uncertainty and inadequacy when faced with unexpected content. The absence of confidence might adversely affect their teaching methods and impede student learning (Martinez, 2022). Manamela (2021) noted that when educators are not equipped to instruct new material, they may resort to obsolete pedagogical techniques or entirely exclude foreign subjects. The disparity between the curriculum and actual instruction might obstruct student understanding and impair their capacity to achieve the intended learning outcomes. Moreover, the difficulties encountered by educators in addressing new material can impact their motivation and job satisfaction. Martinez (2022) found that teachers who feel inadequately prepared to instruct specific subjects may encounter heightened stress and frustration.

### **Summary of the Findings**

The study sought to examine mathematics teachers' readiness to apply the Mathematics NSSCAS curriculum in secondary schools within the Ohangwena region. The research utilized a qualitative methodology, namely through a focus group discussion involving 16 AS-level Mathematics teachers. The study population consisted of 25 AS Mathematics teachers from 11 secondary schools in the Ohangwena region that provide the AS-level Mathematics curriculum. The sample comprised a distinct cohort of 16 Mathematics AS-level teachers randomly chosen from five secondary schools in the Ohangwena region.

The replies indicate a disparity in participants' readiness to apply the Mathematics NSSCAS program. The study highlights that although most teachers may perceive themselves as prepared, a considerable segment necessitates further support and training to attain equivalent preparation.

This holistic strategy for professional development is essential for guaranteeing that all educators are adequately equipped to execute the Mathematics NSSCAS curriculum proficiently.

Teachers' responses indicate that effective readiness for implementing the Mathematics NSSCAS curriculum is affected by various interconnected factors, including timing, resources, training, administrative support, and workload. Addressing these issues in a comprehensive manner can improve instructors' preparedness and capacity to effectively implement the curriculum. This necessitates strategic planning, appropriate resource allocation, ongoing professional development, effective leadership, and manageable workloads for educators.

The participants' responses concerning factors that impact the effective readiness for NSSCAS curriculum implementation also highlight the significance of strong leadership support and the necessity of managing teacher responsibilities during the rollout of a new curriculum. Effective implementation necessitates not only robust administrative backing but also strategies to reduce teachers' burden and guarantee that educators possess the time and resources essential for the successful adaptation to curriculum modifications.

### **Conclusion**

The primary conclusion of this study is that, although certain mathematics teachers in the Ohangwena region perceive themselves as ready to implement the Namibian Senior Secondary Certificate Advanced Subsidiary (NSSCAS) curriculum, a considerable proportion does not. Approximately 63% of teachers felt adequately prepared owing to prior experience and comprehensive training, while 31% felt unprepared, mainly due to inadequate training, insufficient resources, and limited administrative support. The research identified continuous professional development, access to vital instructional resources, and strong administrative support as essential elements for enhancing teacher preparedness. Ensuring the presence of these support mechanisms is essential for optimizing the effectiveness of the NSSCAS curriculum implementation and ultimately advancing student outcomes. Addressing these areas is essential for strengthening teachers' preparedness, ultimately leading to improved student outcomes and more effective implementation of the NSSCAS curriculum. Although centered on five schools in the Ohangwena Region, the insights obtained are instrumental in guiding policy and practice in other regions as well.

### **Recommendations**

Based on the findings of the study regarding teachers' readiness to implement the Namibia Senior Secondary Certificate Advanced Subsidiary (NSSCAS) curriculum, the following recommendations are proposed:

#### ***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***

- Deliver targeted and continuous professional development initiatives for mathematics educators to strengthen their subject expertise and pedagogical competencies aligned with the NSSCAS curriculum. This may encompass workshops, seminars, and opportunities for collaborative learning.
- Ensure that mathematics educators have access to sufficient instructional resources, including a diverse range of curricula, technological tools, manipulatives, and supplementary materials. Effective resource allocation will facilitate the successful implementation of the NSSCAS curriculum.

### ***Recommendations for Teachers***

Engage in professional development initiatives and pursue supplementary learning opportunities to augment their comprehension and pedagogical abilities concerning the NSSCAS curriculum.

### ***Recommendations for Further Research***

Implement longitudinal studies to monitor the advancement and efficacy of the NSSCAS curriculum deployment over time, discerning any enduring effects on teacher readiness and student performance.

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