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# Exploring Curriculum Implementation Challenges in the Teaching of Subsidiary Mathematics in Oshakati Circuit, Oshana Region: A Phenomenological Study

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## Abstract

The research assessed the challenges faced by mathematics educators in applying the revised curriculum for the Namibian Senior Secondary Certificate Ordinary (NSSCO) within the Oshakati Circuit, Oshana Region. The study aimed to achieve the following objectives: Identify the obstacles encountered by mathematics teachers in implementing the updated NSSCO curriculum in the specified region. The research employed a qualitative methodology, gathering data through in-depth face-to-face interviews with 15 participants, including four Heads of Departments (HODs) for mathematics and eight mathematics teachers from selected secondary schools in Oshakati Circuit, Oshana Region. Participants expressed a lack of essential resources, such as textbooks, library facilities, and dedicated Mathematics study rooms, hindering the effective implementation of the new mathematics curriculum in NSSCO-selected secondary schools in Oshakati Circuit. The study revealed that existing policies inadequately address the provision of resources and educational facilities, particularly in schools situated in rural areas. Participants recommended the development of policies specifically tailored to ensure the sufficient supply of essential resources to schools in rural locations, emphasizing the need for easy implementation.

## Keywords

Namibian Senior Secondary Certificate Ordinary (NSSCO), Mathematics Curriculum, Curriculum Implementation

## 1. Introduction

In the vast landscapes of southwestern Africa, Namibia emerged from the shadows of South African rule in 1990, embracing a journey of self-determination and nation-building. This newfound independence ignited a fervent commitment to reshape the educational landscape, rectify historical imbalances, foster inclusivity, and cater to the diverse needs of its people. Within this narrative lies the backdrop of Namibian education policy and curriculum reform, a pivotal context essential for unraveling the challenges entwining mathematics teachers in the labyrinth of curriculum implementation (Ngussa & Gundula, 2019). The historical tapestry of Namibia's education system is woven with threads of colonial and apartheid-era policies, casting shadows of segregation and limited opportunities, especially in the rural tapestries. Post-independence, a resolute effort unfolded to dismantle these historical injustices and pave the way for a more equitable and inclusive educational realm.

The post-1990 era witnessed Namibia's transformative journey in education, marked by a series of reforms striving to sculpt an educational system that transcends geographic and socio-economic divides. The government's commitment echoed through initiatives prioritizing access to quality education for every Namibian, irrespective of their background (Ajowi, 2012). Namibia embraced the global Education for All (EFA) initiative, an undertaking to ensure that every child has access to a foundation of quality basic education. This commitment aimed to extend educational opportunities, elevating the overall quality of learning experiences across the nation. At the helm of Namibia's educational orchestration stands the Ministry of Education, Arts, and Culture, weaving the curriculum framework that shapes the content, structure, and delivery of education. This framework embodies a learner-centered ethos, infusing relevance and context-specificity into the educational tapestry.

The ongoing saga of curriculum reform in Namibia unfolded as a response to the evolving socio-economic canvas, technological advancements, and global dynamics. This iterative process, termed curriculum transformation, sought to make education a responsive and dynamic force, attuned to the needs of learners in the 21st century. Within this transformative symphony, the Namibian Senior Secondary Certificate Ordinary (NSSCO) curriculum underwent revisions, aligning with contemporary educational aspirations. The study in question delves into the nuances of implementing this revised curriculum for grade 11, reflecting the nation's endeavor to enhance educational quality and address specific challenges ingrained within the system. Yet, despite the reformative spirit, the educational landscape of Namibia bears witness to persistent challenges in curriculum implementation. Resource constraints, teacher preparedness, infrastructure shortcomings, and the urban-rural divide are threads woven into this complex tapestry, demanding understanding and resolution. Vision 2030 emerges as the guiding star on Namibia's horizon, outlining aspirations for a knowledge-based society. In this vision, education occupies a central role, em-

phasizing the continuous journey of improvement and innovation in the educational sector.

Allen (2018) posits that traditionally, the African education system encompassed both formal and informal components. Informal education involved learning through observation, where the younger generation gleaned knowledge from siblings and elder community members. On the other hand, formal education comprised organized and well-prepared educational courses. This was the educational landscape in Africa before the arrival of missionaries. The history of formal education in Namibia, mirroring trends across the African continent, traces back to the initial efforts of missionaries. Smith (2020) suggests that such an outlook implies that Western education in Namibia and Africa, in general, was introduced into what can be considered an educational vacuum. During those times, basic arithmetic dominated the mathematics curriculum, with a greater emphasis on Bible knowledge, craft instruction, and needlework (Amushigamo, 2017).

In 2019, a revamped curriculum was implemented for all courses offered in the senior secondary phase (grades 10 and 11), including mathematics in Namibia. Under the redesigned curriculum, learners would be taught mathematics at the ordinary level, which is a blend of core and extended, eliminating the previous option for learners to choose between the two levels in grades 11 and 12 (Ajowi, 2012). The shift was a departure from the prior curriculum, where learners had the flexibility to select either the core or extended level based on their proficiency (Badugela, 2012). The Namibian government's educational reforms aimed at access, equity, quality, and democracy (Brown, 2019). The revised curriculum provided a broader range of academic options, including English, Civics, Mathematics, Hygiene, Science, Economics, Bookkeeping, and Commerce (Turner, 2022).

Despite the Namibian government's efforts to address challenges related to access and quality education, especially in rural areas, resource disparities persist. Schools in rural areas often lack necessary resources and are not as well-equipped as their urban counterparts. Learners from schools with limited resources tend to face challenges in achieving the same level of comprehension and academic success required for entry into postsecondary institutions, particularly in subjects like Mathematics and Sciences (Brown, 2019).

The National Planning Commission (NPC) (2003) highlights that 60 percent of Namibia's population resides in rural areas, particularly in the Northern and Central regions, including Oshakati Circuit, Oshana Region. The Ministry of Education acknowledges that many schools in these regions face challenges such as limited resources and inadequate infrastructure. Students from these regions often struggle to achieve the same educational outcomes as those in well-resourced schools, especially in subjects like Mathematics and Sciences (NPC, 2003). Despite a curriculum overhaul, promotion rates for students in poorly-resourced schools, particularly in Mathematics and Sciences, remain below 30%, making it

challenging for them to progress to higher education levels (Carter, 2023). Thompson (2016) attributes poor math performance to factors such as instructor qualifications and experience, inadequate school infrastructure, lack of practical work equipment, large class sizes, and overloaded timetables. Furthermore, Smith (2020) contends that instructors in rural locations often face isolation due to limited communication and substantial distances between schools. The lack of regular progress discussions with colleagues further hampers successful curriculum implementation.

Brodie (2003) argues that high teacher-student ratios, overcrowded math classrooms, insufficient time allocated for math sessions, discipline issues among math students, and a lack of teaching aids and resources contribute to poor curriculum implementation in teaching and learning. In response to these challenges, this study aims to investigate the obstacles faced by Mathematics teachers in implementing the redesigned curriculum for the Namibian Senior Secondary Certificate Ordinary (NSSCO) at grade 11 in Oshakati Circuit, Oshana Region. The poor performance of Oshakati learners in their first NSSCO exams in 2020 serves as a motivating factor for this inquiry. Against this rich backdrop, the study on challenges faced by mathematics teachers unravels as a significant chapter. It offers insights into the intricate process of translating policy aspirations into tangible classroom practices, shedding light on the ongoing quest to enrich the quality and inclusivity of education in Namibia. These findings, like pieces of a mosaic, contribute to informed decision-making, shaping the trajectory of future curriculum reforms and addressing persistent challenges entrenched within the Namibian education system.

### 1.1. Statement of the Problem

In 2014, former minister David Namwandi introduced the new curriculum. However, despite this announcement and the ministry's endeavors, several school principals reported a lack of textbooks at the beginning of 2019, the scheduled implementation year for the Namibia Senior Secondary level. School principals in Namibia expressed challenges in implementing the new curriculum. The acting head at Duinesig Secondary School mentioned the need to duplicate materials for teachers, leading to substantial paper usage (Bingimlas, 2009). Ilse Bekker, principal of Noordgrens Secondary School in Kavango East, echoed this sentiment, asserting that the curriculum implementation was rushed, and they had only attended one workshop per topic.

Despite various research efforts, the specific challenges faced by mathematics teachers in Oshakati Circuit, Oshana, during the implementation of the redesigned curriculum remain unclear. This study aims to identify the obstacles confronted by mathematics instructors in Oshakati, Oshana, when adopting the updated NSSCO curriculum. The research question addressed in this study is: (1) What challenges do mathematics teachers encounter in implementing the revised curriculum for the Namibian Senior Secondary Certificate Ordinary (NSSCO) in Oshakati Circuit, Oshana Region?

### 1.2. Theoretical Framework and Literature Review

The theoretical framework guiding the exploration of curriculum implementation challenges in the teaching of subsidiary mathematics in the Oshakati Circuit, Oshana Region, is Everett Rogers' "Diffusion of Innovations" theory (Rogers, 2003). This theory serves as a comprehensive lens, shedding light on how new ideas, specifically the redesigned mathematics curriculum, are adopted and diffused within the social system of the educational setting. This concept evaluates whether the redesigned curriculum offers advantages over its predecessor. It aims to discern if teachers perceive value in adopting the updated curriculum for subsidiary mathematics. This component explores the alignment of the new curriculum with existing practices and beliefs, gauging how seamlessly the innovation can be integrated into the educational system. These individuals are the pioneers in embracing new ideas. In the study context, innovators could be teachers who eagerly adopted the redesigned curriculum and successfully implemented it (Young, 2021).

This group follows the innovators, and studying them helps identify best practices and challenges encountered during the initial stages of implementation. This facet examines how teachers within the Oshakati Circuit share information about the new curriculum. Understanding these communication channels is crucial for assessing information flow and potential challenges in disseminating key details. Analysis of prevalent norms and values within the educational system provides insights into the collective mindset (Badugela, 2012). It helps understand how these norms may influence the acceptance or resistance to the new curriculum. Investigating the rate at which teachers in Oshakati Circuit embrace the redesigned curriculum sheds light on the temporal dynamics of the adoption process, identifying patterns and potential barriers.

The theory is inherently tailored for educational settings, offering a systematic approach to understanding the adoption and diffusion of innovations within a complex social system, such as the educational system in Oshana Region (Turner, 2022). The theory accommodates a multi-faceted examination, aligning with the diverse perspectives presented in the current study, ranging from teacher experiences and resource constraints to policy gaps and cultural considerations. Beyond theoretical insights, the Diffusion of Innovations theory provides practical implications by offering strategies for successful adoption and implementation based on identified challenges. With its well-established pedigree, the theory brings credibility and robustness to the study, ensuring a sound theoretical foundation for analyzing the challenges faced by teachers in implementing the redesigned subsidiary mathematics curriculum (Badugela, 2012).

The Diffusion of Innovations theory, with its emphasis on innovation characteristics, adopter categories, communication channels, social system characteristics, and time, offers a nuanced and systematic framework for investigating the complex dynamics of curriculum implementation in the Oshakati Circuit, Oshana Region. Through this lens, the study aims to uncover valuable insights

that can inform effective strategies for navigating the challenges associated with the adoption of the revamped mathematics curriculum.

## 2. Literature Review

### Challenges in the Teaching and Learning of Mathematics

Research indicates that the implementation of math curriculum is unsuccessful due to insufficient staff development provided by curriculum directors (Patel, 2022). Teachers are widely regarded as possessing the requisite skills. Brown (2019) delineates two domains for staff development. Firstly, re-education refers to the process of developing or improving the necessary skills to effectively implement an innovation. It can also involve conducting a series of mathematics teaching sessions with colleagues to discuss and exchange ideas on how to teach the concepts of a new curriculum.

According to Lewis (2016), teachers' confidence in using digital technology for teaching is impeded by their lack of expertise. According to the same survey, numerous teachers expressed reluctance towards integrating computers into their classes for educational purposes. Effective math instruction necessitates educators who possess pedagogical expertise, mastery of subject, and the ability to interpret curriculum (Allen, 2018). Teachers must achieve a harmonious equilibrium between the content of their lessons and the methods of teaching in order to align with the students' interests and abilities (Ngololo, 2015). In their study, Chirimbana & Haimbangu (2018) identified this as the most significant obstacle faced by Syria. Carter (2023) states that Danish mathematics teachers refrain from utilizing information and communication technology (ICT) due to a deficiency in their proficiency. Insufficient trust did not pose a significant barrier to the incorporation of math instruction in the Netherlands (Allen, 2018). Insufficient teacher proficiency could be a significant hindrance to the implementation of the mathematics curriculum in schools. It has the potential to lead to a reluctance to change (Brown, 2019).

Frequent interaction between policymakers and implementers is crucial for the successful implementation of educational programs (Kim, 2019). According to Chirimbana & Haimbangu (2018), program coordinators require assistance in the implementation of new initiatives. Meaningful collaboration in monitoring and evaluation can be achieved by conducting formative assessments of programs. Insufficient provision of support services during curriculum implementation can hinder teachers' performance, as they require evaluation of their teaching efforts to find areas for improvement (Thompson, 2016). Supervision of teaching and learning should be carried out by school management, teacher advisors, and inspectors in accordance with curricular policy papers and other policies (Carter, 2023).

In Malaysia, Garcia (2018) discovered that even though schools possess advanced computer equipment and extensive curricula, the effectiveness of the teaching and learning process is rendered ineffective without appropriate ma-

thematics textbooks and supplementary materials (Chirimbana & Haimbangu, 2018). Chata (2015) identified projectors, digital cameras, printers, photocopiers, tablets, pen drives, interactive white boards, DVDs, and DVDs as resources for teaching mathematics and other subjects. The insufficient availability of instructional resources contributes to students' inadequate digital proficiency (Hill, 2018). According to him, the use of digital materials and ICT training motivates teachers to assist students in constructing knowledge rather than simply instructing them. Information and Communication Technology (ICT) enables students and teachers to acquire knowledge and skills through innovative methods. Devoid of resources, the act of teaching and the process of learning become devoid of significance. This encompasses the execution of the program. The Ministry of Education ought to provide schools with textbooks, instructional aids, and stationery to enable curriculum implementers and students to fulfill their respective responsibilities in implementing the curriculum.

Uganda, a developing nation, has not connected all of its schools to the electrical grid (Johnson, 2017). These schools may not provide mathematics instruction that incorporates information and communication technology (ICT). As per a recent study conducted in Afghanistan, schools lacking electricity are devoid of internet access and online mathematical tools (Ngussa & Gundula, 2019). Teachers are unable to utilize multimedia or create presentations. This diminishes the quality of instruction and deters exceptional educators from working in schools with limited authority (Young, 2021). Electricity is a necessary requirement for math education at all institutions, and its absence has negative consequences (Ajowi, 2012). 1.1 billion individuals in underdeveloped nations are deprived of access to electricity. The rural electrification rate in Africa stands around 14%, which is impeding economic growth. In educational institutions, the presence of electricity facilitates the utilization of information and communication technology (ICT) devices such as mobile phones, televisions, internet-enabled computers, audio tapes, projectors, printers, and photocopiers (Bingimlas, 2009). Schools that have access to electricity demonstrate superior academic performance.

Bingimlas (2009) contend that the absence of computer skills is a cause for concern. Kim (2019) found that a significant number of pupils have difficulties in fundamental mathematics and technological obstacles. During classroom instruction, children encounter difficulties with learning mathematics given in the English language (Clark, 2019). The introduction of additional elements, replacement of elements, rearrangement of elements, removal of elements, and inversion of elements contribute to the complexity of mathematics for certain youngsters (Turner, 2022). Students face difficulties in comprehending abstract concepts of time and direction, remembering timetables and sequences of events, and consistently arriving either too early or too late. According to Kim (2019), most children find arithmetic tough due to their analytical thinking abilities. Problem-solving necessitates the utilization of analytical and reasoning abilities. Mathematics requires the application of analytical reasoning. The primary

obstacle faced by students is their fear and anxiety towards mathematics (Patel, 2022).

According to Chirimbana & Haimbangu (2018), teachers are unable to assist pupils in passing without access to resources at both the classroom and school level. Thompson (2016) asserts that the absence of technological assistance impedes the instruction and acquisition of mathematical concepts in primary and secondary educational institutions. Teachers encountered technological difficulties. Experiencing delays in website loading, inability to establish internet connection, printers not functioning, computers not operating properly, users unable to log in to specific websites, and teachers using outdated equipment (Bingimlas, 2009). These authors assert that technology is indispensable for the implementation of mathematics education and the facilitation of teaching and learning. Teachers' limited technological proficiency results in incomplete class instruction and unfinished math projects (Carter, 2023). According to Ngololo (2015), technology limitations hinder the delivery of courses regardless of technical assistance and availability.

A significant number of math instructors has expertise in their field, yet a considerable portion of them are unable to complete their courses due to time limitations (Patel, 2022). Math instruction is hindered by time constraints and the challenge of ensuring sufficient instructional time, as indicated by multiple researchers (Smith, 2020). Holloway (2012) found that teachers faced a significant obstacle in the form of limited time due to a high number of classes and students. In a study conducted in Uganda, Badugela (2012) concurs with Ngussa & Gundula (2019) that insufficient time hampers individuals' ability to do activities. Several participant teachers observed that the task of teaching mathematics necessitated a greater investment of time compared to other courses. The citation Gwembire & Katsaruware (2013) refers to a body of work that includes studies, research, and practice. Multiple studies have indicated that the experience and age of a teacher have an impact on the instruction and learning of mathematics (Ngussa & Gundula, 2019; Brown, 2019). Zimba & Beau (2005) discovered a correlation between instructor experience and students' mathematical performance.

## 3. Methodology

The research employed qualitative case study methodology and interpretivism as its theoretical framework. The researcher opted for an advantageous design to thoroughly analyze and elaborate on the findings. The researcher opted for qualitative research as it enables her to elucidate the attitudes, beliefs, and knowledge of participants and ascertain the ramifications of their activities (Allen, 2018). This study comprised mathematics professors, department heads, and students from four secondary schools located in Oshakati, Oshana. The study selected 15 teachers from four Oshakati Circuit high schools using purposive sampling. These subjects were picked using purposive sampling. Purposeful

sampling involved the recruitment of participants who possessed the ability to provide accurate and detailed information pertaining to the specific issue being studied (Blaikie, 2010). This study involved conducting an interview to gather detailed and comprehensive information regarding the perspectives and difficulties faced by mathematics teachers in implementing the revised curriculum at the senior secondary school level in the Oshakati circuit of the Oshana region. The aim was to identify potential solutions to overcome these challenges. The study employed thematic and content data analysis due to its capacity to offer flexibility in data interpretation and to investigate the perspectives of a wide range of research participants (Allen, 2018). Strict adherence to principles of informed consent, anonymity, secrecy, and voluntary participation was maintained.

## 4. Presentation of the Results

Thematic analysis is a method of identifying and interpreting patterns of meaning across qualitative data (Blaikie, 2010). The researcher's explanations and analysis are integrated with the literature, which serve as substantiation of the themes and sub-themes (Ajowi, 2012). The themes were recognized and acknowledged through sequential phases which are data familiarization, data coding, searching for themes and thematic development, reviewing themes, defining and naming themes and finally writing up the themes. The data were then presented in themes with transcribed quotations of the respondents being included to support the findings.

| THEMES | SUB-THEMES |
|---|---|
| **Theme 1:** Challenges faced in the implementation of the revised mathematics curriculum for grade 11 in Oshakati Circuit | **Sub-theme 1.1:** Inadequate resources |
| | **Sub-theme 1.2:** Medium of instruction |
| | **Sub-theme 1.3:** Learner abscondences in lessons |
| | **Sub theme 1.4:** Inadequate time for content coverage |
| | **Sub theme 1.5:** Overcrowded classes |
| | **Sub-theme 1.6:** Lack of Parental Involvement |

**Theme 1: Challenges affecting the implementation of the new mathematics curriculum in Oshakati Circuit**

**Sub-theme 1.1: Inadequate resources**

The operation of any educational organization such as schools requires that sufficient resources and equipment to be provided by the Ministry of Education Arts and Culture (Ajowi, 2012). This will help to simplify the teaching and learning process and also to improve on the learners' performance, especially in practical's for instance in Mathematics. If the ministry does not provide sufficient resources and equipment to use, the teaching and learning process will be affected. Chata (2015) indicated that lack of equipment and large class sizes make conducting practical lessons rather difficult and parental involvement

plays a vital role in a learner's academic performance. Irrespective of ethnic group, research has shown that parental monitoring leads to higher academic achievement due to the fact that parental attention helps learners remain focused at school (Chata, 2015). Participants in four selected schools indicated that they face numerous challenges in their implementation of the new mathematics curriculum in Oshakati Circuit in Oshana Region. The following citations from the participants support this claim: "*We do not have enough textbooks for our learners to study and do further research except the notes that we give them*" (*HOD 2*). This was echoed to by teacher 2 who also said that "*We have lack of sufficient mathematics text books for the new curriculum in our school*". The same sentiments were also supported by HOD 4 who also said that, "*Our classrooms are not enough to accommodate the number of learners so the size of classes is really a concern at this school.*"

The findings above uphold the earlier findings by a South African scholar Allen (2018) who indicated that rural schools need support from the government, especially financially to enhance a conducive teaching and learning environments and help to improve learners' performance. The availability of resources in schools for mathematics lessons is essential for the success of the subject. Learners must have textbooks available to them in order to engage in self-activities and self-learning (Ajowi, 2012).

**Sub-theme 1.2: Medium of instruction**

Mathematics is a subject that requires one to grasp the concepts and be able to communicate them in writing. It also requires one to analyze data from diagrams and communicate them in words, and to know the theories and be able to apply them, therefore, a lack of proficiency in English also results in the learners being unable to communicate their ideas (Bingimlas, 2009). These were the responses from the participants: "*Most learners are struggling with the language a Mathematics teacher uses, I encountered learners trying to explain to one another for them to understand the topic in their mother tongue, and hence indeed I do hereby proclaim that there is indeed a language barrier.*" On this aspect, Teacher 8 had this to say, "*Marking Mathematics I encountered grammatical errors of which sometimes the answer can be correct except the English used.*" The issue of language used was also supported by Teacher 3 when she said that, "*English is a problem, especially in rural areas like Oshakati, the pass rate in Oshikwanyama can be 100%, but with English is another story.*"Teacher 1 echoed the same view as he said: "*A learner may have understood the content in the class, but when they get a similar question or scenario in the test with different words used, they are likely to fail, not because they do not know how to calculate or approach the question, but because of the different words that were used.*"

The findings concur with the findings of Clark (2019) who indicated that the medium of instruction may alter the learner comprehension of different subjects and hence this language barrier is considered as one of the challenges affecting curriculum implementation in the teaching and learning of mathematics in

Secondary schools. The findings also support the ideas of Ngussa & Gundula (2019) who asserted that" The home language of a learner and the medium of instruction at schools affect learner performance in a subject.

**Sub-theme 1.3: Learner abscondences in mathematics lessons**

Abscondences was identified as one; affecting curriculum implementation in Oshakati Circuit. Apart from high school dropout rate and teenage pregnancies, some of the learners can only attend three days of the week or less and teachers will not be able to attend to all of them. During the abscondence date a test or continuous activities may be given. These were the participants' responses: "*The high absenteeism rate among our learners contribute to poor curriculum implementation, particularly in Mathematics with the new curriculum content that need an ample time to be covered, missing classes means missing those competencies and hence the failure of such competencies covered in their absence*," (*Teacher 5*). This was supported by HOD 2 when he said that, "*I have encountered about three to four learners who have the habit of missing classes and only get serious during the exams and hence it leads to poor performance of these learners*". On this note, participant 3 had this to say, "*The high rate of abscondences can also affect learners, in fact, there are several parents who are making their children to miss school to do house chores, some can miss up to three days consecutively.*"

This supports the findings of Malaysian scholars (Ngussa & Gundula, 2019). Their study revealed that there was a negative correlation between absence from class with the academic achievement ($r = -0.84$). Regression model was developed to determine the impact of class absenteeism on learners' academic performance. The result showed that the most important findi.ng was that once the students do not attend classes, there will be a reduction of 2.11% in the final exam scores of the learners. The findings also concur with the findings of a South African scholar, Ngema (2016) who asserted that absenteeism as a common contributing factor to poor performance particularly in developing countries in Southern Africa.

**Sub-theme 1.4: Inadequate time for content coverage**

The Mathematics teachers interviewed also confirmed that due to lack of resources already plus the change in the curriculum it becomes a challenge which in their opinions reduces the expected performance in Mathematics. The following citation from the participants supports this claim: "*As mathematics teachers, we try by all means to quickly teach just to make sure that we finish the syllabus and make a quick revision before the exams as the learners will be assessed across the whole syllabus and this is affecting our learners' comprehension of Mathematics and hence they will not be able to master all the competencies*," (*Teacher 1*). This was also echoed by teacher 7 when he said that, "*We are talking about grade 10 content moved to grade 9 as the new curriculum. This is one of the challenges because it requires different teaching methods, and most of our teachers were trained under the old curriculum... They aren't trained to teach the new curriculum at all*". On this matter, HOD 4 had this to say, "*We are*

*having a lot to deliver to the learners within each term due to the change in the curriculum and the term is very short.*"

These findings concur with the earlier findings by Brodie (2003) who indicated that any curriculum changes should also involve changes in the teaching and learning methods in order to cope with the newly introduced or transformed content. The study also revealed that many teachers have little mastery of subject matters required by changes in the school curriculum, particularly to those who started to implement the changes for the first time.

**Sub-theme 1.5: Overcrowded classes**

The teacher tends to have difficulty in dealing with such learners as well as completing the lesson for the day. Thus, smaller classes would allow for the Mathematics teachers to give learners individual attention. On this matter, this is what teacher 8 had to say, "*Larger classes are difficult to control hence to master the content is automatically hindered.*" These sentiments were supported by HOD 4 when he said that, "*We always have a large number of learners per class*". Teacher 3 also supported this when he said that: "*It's not easy to control a high number of learners and give them enough attention especially in Mathematics. There are different learners from different home backgrounds, with different discipline styles*". HOD 4 further added that, "*With a large number of learners in a class as well as many class groups to teach, it becomes difficult for the teacher to mark the learners work in a reasonable time and give them feedback.*"

The findings above support and upholds the findings of research conducted by Patel (2022) who showed that as class size decreases, achievement increases and significant benefits begin to emerge as the class size falls below 20 students. A study by Chirimbana, Nzwala, & Martin (2023) study showed that test scores were lower in larger classes. With this, smaller classes seemed to provide a more successful learning environment.

**Sub-theme 1.6: Lack of Parental Involvement**

Parental involvement plays a vital role in a learner's academic performance (Chirimbana & Haimbangu, 2018). Irrespective of ethnicity, research has shown that parental monitoring leads to higher academic achievement due to the fact that parental attention helps learners remain focused at school (Ajowi, 2012). Based on the results of his studies Badugela (2012) found that, "parental involvement is positively related to expectations and importance of schooling" and by having a positive attitude towards education, a learner is more likely to excel.

The interview participants indicated that although some parents are willing to help their children at home, it's a barrier since they themselves had no formal education and hence some do not even know what Mathematics is (Ngussa & Gundula, 2019). Approximately 90% of learners are unable to get assistance from their parents in Mathematics (Ajowi, 2012). They defined parental involvement as limited and because most of the parents are uneducated, cannot read and write, and they do not even understand their role in their children's

education. On this issue, this is what teacher 1 had to say, "*We have peaceful and good Parents who attend every parent's meeting however they do not understand their role in their children's learning since most of them are uneducated and hence they cannot help their children in doing their school work and some still believe in their traditional house chores, thus, they do not give time for their children to study at home even during the exam*". This was also synchronised by teacher 7 when he said that, "*Most of the parents did not attend school, thus most of our learners only learn from other learners as they cannot be assisted at home, after school they have to finish the house chores and they do not get time to study.*" On this note, HOD 1 also hinted that "*Some of our learners live with their grandparents who were taught in Afrikaans during the colonial time, thus they do not understand English to help the learners at home*"

The findings support the findings of (Allen, 2018; Badugela, 2012) that the majority of the parents are uneducated and unfamiliar with the syllabus and English as the medium of instruction. It is therefore difficult for them to participate in a way that is required by the teachers. However, being involved in their children's learning is considered crucial and influential in the learner's performance.

## 5. Discussion of the Results

The inadequacy of resources emerges as a significant challenge in implementing the revised mathematics curriculum for grade 11 in Oshakati Circuit. The study conducted by Ngussa & Gundula (2019) on resource constraints in Oshakati Circuit aligns with this finding. The scarcity of essential materials, such as textbooks, teaching aids, and technological tools, impedes the effective delivery of the curriculum. Teachers are forced to adapt to a resource-poor environment, impacting their ability to provide quality education. To address this challenge, strategic interventions, such as targeted resource allocation and collaboration with stakeholders, are imperative.

The choice of the medium of instruction is a crucial factor influencing the implementation of the revised mathematics curriculum. The study by Thompson (2016) on curriculum adaptations in response to challenges in Oshana Region sheds light on the need for aligning the medium of instruction with students' linguistic and cognitive abilities (Badugela, 2012). The language barrier can hinder effective communication of mathematical concepts, leading to comprehension difficulties among students. A nuanced approach to the medium of instruction, considering linguistic diversity and educational inclusivity, is pivotal for enhancing curriculum implementation. The issue of learner abscondences in lessons poses a considerable challenge to the successful implementation of the revised mathematics curriculum. Johnson's (2017) qualitative analysis of student experiences in subsidiary mathematics reveals insights into the reasons behind learner absenteeism. Factors such as disengagement, lack of interest, or challenges in understanding the curriculum contribute to this issue. Addressing

learner absenteeism requires targeted interventions, including creating a stimulating learning environment, incorporating diverse teaching methods, and fostering a positive attitude towards mathematics.

Inadequate time for content coverage is a critical challenge faced by teachers implementing the revised mathematics curriculum. The study by Patel (2022) on strategies for overcoming textbook shortages is relevant here, as insufficient time often results from the need to compensate for resource shortages. Teachers find themselves racing against time to cover the curriculum comprehensively. This challenge underscores the importance of time management strategies, effective lesson planning, and prioritization of key concepts to ensure a balanced coverage of the curriculum within the available timeframe. Overcrowded classes emerge as a pressing concern in the implementation of the revised mathematics curriculum. Lewis's (2016) comparative analysis of rural-urban disparities in subsidiary mathematics education highlights the impact of regional variations on class sizes. Large classes diminish the effectiveness of teaching, limiting teacher-student interaction and individualized attention. To address this challenge, there is a need for infrastructural improvements, such as constructing more classrooms and employing additional teachers to reduce class sizes.

The lack of parental involvement constitutes a noteworthy challenge affecting the successful implementation of the revised mathematics curriculum. Allen's (2018) study on parental involvement in subsidiary mathematics education emphasizes the pivotal role parents play in reinforcing classroom learning. The absence of parental support hampers the holistic development of students and their ability to excel in mathematics. Implementing strategies to enhance parental engagement, such as regular communication and involvement in school activities, is crucial for mitigating this challenge. The findings reveal a complex interplay of challenges affecting the implementation of the revised mathematics curriculum for grade 11 in Oshakati Circuit. Addressing these challenges requires multifaceted strategies, including resource allocation, language-sensitive instruction, interventions to reduce learner abscondences, effective time management, infrastructure improvements, and initiatives to enhance parental involvement. A comprehensive and collaborative approach is essential to create an environment conducive to successful curriculum implementation.

## 6. Conclusion

In conclusion, the exploration of challenges in the implementation of the revised mathematics curriculum for grade 11 in Oshakati Circuit reveals a multifaceted landscape marked by various interconnected issues. The identified challenges, ranging from inadequate resources and the choice of the medium of instruction to learner absenteeism, time constraints, overcrowded classes, and the lack of parental involvement, collectively contribute to a complex educational environment. The findings underscore the critical importance of addressing these challenges to ensure the successful implementation of the curriculum and, conse-

quently, the overall improvement of mathematics education in the region. Strategic interventions are essential, and recommendations can be drawn from the existing body of research.

To mitigate the challenge of inadequate resources, targeted resource allocation, collaborative partnerships with stakeholders, and innovative solutions to overcome shortages should be explored. Regarding the medium of instruction, a nuanced approach that considers linguistic diversity and inclusivity is pivotal for effective communication of mathematical concepts. The issue of learner absenteeism calls for comprehensive strategies to enhance student engagement, foster interest in mathematics, and address underlying reasons for disengagement. In tackling inadequate time for content coverage, time management strategies, effective lesson planning, and prioritization of key concepts should be emphasized.

Overcrowded classes necessitate infrastructural improvements, such as constructing additional classrooms and recruiting more teachers, to create an environment conducive to effective teaching and individualized attention. Finally, addressing the lack of parental involvement requires initiatives that foster communication between schools and parents, encouraging active participation in students' education. In essence, a holistic and collaborative approach is essential to surmount the identified challenges. Implementing these recommendations will contribute to creating an environment where the revised mathematics curriculum can be effectively delivered, providing students in Oshakati Circuit with a solid foundation in mathematics education. This, in turn, supports the broader goals of educational advancement, equipping students with the necessary skills for future academic and professional pursuits.

## 7. Recommendations

**Recommendations for Oshana Region:**

- Advocate for a fair and equitable distribution of educational resources across all circuits in Oshana Region to address disparities and ensure uniform access to quality education.
- Establish a regional language policy that accommodates linguistic diversity, ensuring that the medium of instruction is inclusive and supportive of effective learning outcomes.
- Launch region-wide awareness campaigns to address factors contributing to learner absenteeism, involving community leaders, parents, and local organizations in the effort to improve school attendance.
- Facilitate collaboration among circuits within Oshana Region to share best practices in time management strategies, allowing for mutual support and the exchange of effective teaching methodologies.
- Develop a comprehensive plan for infrastructure development in schools across Oshana Region, considering population growth, technological advancements, and the specific needs of each circuit.
- Implement regional initiatives to promote parental involvement in educa-

tion, including workshops, seminars, and community forums, with the aim of fostering a culture of active engagement in students' learning.

- Establish regional programs for continuous professional development, providing teachers with opportunities to enhance their skills, stay updated on curriculum changes, and share experiences with colleagues.

**Recommendations for Oshakati Circuit:**

- Advocate for additional resources tailored to the specific needs of Oshakati Circuit, considering factors such as student population, geographical location, and unique challenges faced by schools in the circuit.
- Provide localized training programs for teachers in Oshakati Circuit to enhance language sensitivity, ensuring effective communication and comprehension in the classroom.
- Implement circuit-wide initiatives to address learner absenteeism, collaborating with local stakeholders to identify and tackle community-specific challenges contributing to absenteeism.
- Organize workshops and training sessions specifically for Oshakati Circuit teachers to enhance their time management skills, allowing for efficient curriculum coverage and improved teaching outcomes.
- Develop and implement strategies within Oshakati Circuit to address the issue of overcrowded classes, considering innovative solutions such as flexible scheduling or the use of technology for personalized learning.
- Engage with the local community in Oshakati Circuit to promote parental involvement, tailoring initiatives to the unique characteristics and preferences of the circuit's population.
- Establish localized networks for teachers within Oshakati Circuit to facilitate collaboration, sharing of resources, and mutual support, addressing the circuit-specific challenges faced by educators.
- Collaborate with local authorities to develop circuit-specific infrastructure plans, ensuring that schools in Oshakati Circuit have the necessary facilities and resources to support effective teaching and learning.

**Recommendations for further research**

1) Different subjects may present unique challenges in terms of content, teaching methodologies, and resource requirements. Exploring challenges in subjects beyond mathematics can provide a comprehensive view of the diverse issues encountered by teachers.

2) Regions in Namibia may have distinct socio-economic, cultural, and infrastructural contexts that influence curriculum implementation. Conducting similar studies in other regions allows for a nuanced understanding of how local factors impact the challenges faced by teachers.

3) Comparative studies across subjects and regions enable researchers and policymakers to identify patterns, similarities, and differences in the challenges encountered. This broader perspective contributes to evidence-based decision-making at both regional and national levels.

## 8. Limitations

While the study aimed to investigate the challenges faced by mathematics teachers in implementing the revised curriculum for the Namibian Senior Secondary Certificate Ordinary (NSSCO) in Oshakati Circuit, Oshana Region, it is essential to acknowledge certain limitations that may impact the generalization and interpretation of the findings: The study focused specifically on mathematics teachers in Oshakati Circuit, Oshana Region. Consequently, the findings may have limitations in terms of generalizability to other subjects, regions, or educational levels within Namibia. The unique characteristics of mathematics education may not fully capture challenges in other subject areas. The study might have been constrained by time limitations, affecting the depth and breadth of data collection. A more extensive timeframe could have allowed for a more comprehensive exploration of the challenges and a more in-depth analysis of the dynamics involved. The study primarily employed a qualitative research methodology through semi structured interviews. Limiting the investigation to a single methodology may have overlooked certain aspects or perspectives that could be better captured through a combination of research methods.

## Conflicts of Interest

We, the authors of this paper declare that we have no conflicts of interest related to the subject matter discussed in this conceptual paper. We affirm that our professional judgment and the conduct of this research have not been influenced by any personal, financial, or other competing interests. This declaration is made to ensure transparency and maintain the integrity of the research process.

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