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Rumanyo as a Medium of Instruction in Mathematics Grade 1 Classrooms: Kavango East Region Teachers' Perspectives

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Abstract

In multilingual postcolonial countries like Namibia, the medium of teaching is a critical problem in language education policy. Teachers have an important part in language policy implementation, and their beliefs have an impact on it. As a result, it is critical to investigate their attitudes towards language education policy and its implementation. The aim of this study was to examine the Rumanyo grade 1 teachers' perspectives of teaching mathematics in Rumanyo and to establish the importance of teaching mathematics in the junior primary phase in the medium of Rumanyo as an indigenous language in Namibia. This study adopted the mixed method research design, and it is framed in the constructivist theory. The study was participated in by a sample size of ten teachers, five management members and three advisory teachers in Kavango east region (KER) who were purposively selected. Data was gathered using the focus group interview guide and a classroom observation checklist. Qualitative data were presented verbatim and in themes and a content analysis was used to analyse qualitative data, whereas quantitative data were presented in tables and graphs and used the descriptive analysis to analyse data. The findings of the study reveal that teachers have different perspectives of using mathematics as a medium of instruction to teach mathematics in the junior primary phase. The findings reveal that the use of Rumanyo as a mother tongue to teach mathematics in grade 1 is important because it promotes great communication flow between teachers and learners, it enhances mathematics vocabularies in the Rumanyo language. However, teaching mathematics in Rumanyo may also hinder the performance of some learners who were taught in the medium of English at the pre-primary level. Against these findings, the study proposes that another study should be conducted to

establish the perspectives of student teachers who are being trained to teach mathematics in the junior primary phase in the medium of Rumanyo and identify the dependent and independent variables associated with the challenges and successes of teaching mathematics in the medium of mother tongue and develop a framework to ease the tension of mother tongue instruction of mathematics.

Subject Areas

Education, Linguistics

Keywords

Grade 1, Kavango East Region, Mathematics, Mother Tongue, Perspectives, Rumanyo, Rundu and Ndiyona Circuit

1. Introduction

The existing literature has different views about teaching mathematics in the medium of the mother tongue. [1] [2] contend that today's mathematics teachers face numerous problems while teaching maths to students who speak English as a second language. Learning can be difficult for pupils as well. Some educators argue that maths is an international language because it is numerical and deals with symbols, hence teaching the subject does not necessitate the use of any other languages. Other educators argue that language, such as English, plays an important role in teaching mathematics since it allows students to reflect, communicate, and improve their understanding while learning how to solve arithmetic issues. According to [3] [4], teaching mathematics is more than just teaching the fundamentals of the subject; it is also about pupils learning how to solve maths problems while also being able to articulate their grasp of them, either in writing or vocally. [5] posits that the mother tongue refers to the first language (FL), home language, native language, or vernacular spoken by every individual at home. Whereas the language spoken by students at home and utilised as a medium of education in school is referred to as mother tongue-based instruction (MTBI). [6] assert that the term mathematics is derived from an ancient Greek word that means science knowledge. Mathematics is concerned with spatial shapes and the quantitative relationships that exist between them. Certain ways are used to communicate this system of mathematical knowledge to students. Methodology is a Greek term that means way. At a certain time in the evolution of mathematics, applies the laws of the unit. The school's focus on modern students and educational goals has resulted in a significant shift in the subject of mathematics instruction. They further alluded that to effectively teach mathematics to primary school pupils, the teacher must be able to master and master the teaching methods for primary school students.

On the other hand, [7] registers that in multilingual postcolonial countries

like Namibia, the medium of teaching is a critical problem in language education policy. Teachers have an important part in language policy implementation, and their beliefs have an impact on it. This is because teachers are the ones who need to understand the language policy and put it into practice in their classrooms, thus, they truly need to understand the policy fully and also have the love to teach a certain language and also be proficient in it. As a result, it is critical to investigate their attitudes towards language education policy and its implementation. It should be noted that teaching maths in the student's home language also causes difficulties for many students. Nonetheless, some educators and math teachers continue to believe that math is language-free because it relies solely on numbers and symbols. Similarly, the connection between language and mathematics is now widely accepted. Language elements such as mathematical academic writing vocabulary, syntax, and reading are key issues that make mathematical writing tough. As a result, language is vital for teaching maths because the latter relies heavily on linguistic communication through symbols [1]. Substantively, numerous research on the usage of the mother tongue indicates that it is useful. [8] stated that various elements have been proposed to interact with online learning motivation in an effort to address attrition and participation problems. Learners have lower levels of motivation when they skip lessons or do not participate in activities due to a lack of interest in the language and subject matter. Furthermore, if students do not comprehend the language and are unable to fully participate in class, they will become discouraged and quit. He went on to say that this results in poor quality education, which frequently has an unfair impact on disadvantaged groups, as well as school and resource loss as students drop out or end up repeating the same level.

The study of [9] on "The Use of Mother Tongue in Teaching Elementary Mathematics" aimed at determining the teachers' level of preparedness in teaching Mathematics using Mother Tongue-Based instruction and also investigated teachers' input on the implementation of Mother Tongued Basic instruction and proposed that pupils' education begin with the language they are familiar with and comprehend well, as this will give a firm foundation and encouragement for school attendance. Mother Tongue as a teaching medium would allow elementary school students to immediately create and clarify, communicate their thoughts, and formulate new concepts to what they already knew without worry of making grammatical errors. Relatedly, the study of [10] that aimed at determining the effectiveness of mother tongue-based as a medium of instruction in teaching Mathematics in Grade 1 classes reveals that using the Waray mother tongue to teach basic number concepts and operations helps to lay a solid foundation for comprehending and learning higher mathematics. This strategy is useful not just for piquing students' interest in the lesson, but also for serving as a springboard for introducing new mathematical concepts and principles, as well as for expanding student comprehension of why mathematical operations or processes operate.

The quantitative study of [11] which aimed at the perceptions of teachers towards the use of the Mother Tongue as a medium of instruction in the teaching of Mathematics found out that the Language of Instruction plays a critical and significant function in the realisation of the teaching and learning process. As a result, deciding which language to use remains a point of contention among academics and a source of anxiety for educators. Along these lines, teachers' cognition regarding a language used for education is an important factor to examine, as cognition drives behaviour. The study of [12] [13] affirms that a recent study has shown that a mismatch between the language of instruction and the language spoken and understood by students might impede successful teaching and learning [13]. According to the available literature, using the mother tongue in the teaching of mathematics in elementary schools improves student achievement. Moreover, in order for children to be interested in mathematics and make sense of what they are learning, their culture must be incorporated into mathematics. Mother tongue is an important part of a child's culture and should not be overlooked if good outcomes are to be obtained. In addition, children grasp mathematics better when it is taught in their native language.

The study of [14] on the language of instruction in mathematics teacher education for the early grades which aimed at lecturers' perspectives on the use of MT in mathematics instruction is considered critical in influencing the values and attention they concentrate on preparing student teachers to effectively teach mathematics in MT. The study attempts to discover mathematics instructors' perspectives on MT instruction at the university level. The findings revealed that, while instructors were aware of the benefits of teaching mathematics in MT, not all agreed with teaching in MT, particularly at the university level. The findings also revealed that there are several hurdles to teaching mathematics in MT at the university level, including students' backgrounds and a shortage of resources, such as professors who speak MT.

The study of [15] evaluated the effectiveness of the use of the Mother Tongue in teaching the concepts of fractions among second-grade elementary school pupils and found that the usage of the Mother Tongue Language (MTL) is more effective than non-MTL in teaching fraction concepts. It was decided that MTL could be used as the medium of instruction in grade two lessons. It was suggested that relevant and up-to-date instructional materials be made available in order to carry out a successful teaching-learning process.

In a study conducted in South Africa by [16] on Foundation Phase teachers' experiences with instruction in the mother tongue in the Eastern Cape found that the vast majority of FP teachers had not acquired training to teach subjects in isiXhosa. This study also found that teachers had multiple issues teaching mathematics and life skills using isiXhosa as a medium due to a lack of vocabulary to match the ideas of mathematics and life skills. The authors propose that teacher education institutions provide adequate and relevant professional training to FP teachers in order for them to effectively teach in isiXhosa. The writers also advocate for the translation of all textbooks, readers, educational media,

study aids, and associated literature into isiXhosa. The study of [17] shares the same sentiments with [16] and relays that materials in the language of instruction must be available for both teachers and students. To guarantee that quality resources are available, governments, donors, and non-governmental organisations (NGOs) must allocate enough time for the development, pilot testing, and evaluation of mother tongue and second language materials. She further postulates that teachers who translate a second language into a native language must have a more profound linguistic and cultural grounding in their mother tongue than in a second language that they must learn in order to offer instruction. The translator who translates into his or her native language has a more fundamental and practical understanding of his or her native language's many linguistic features, such as semantics, syntax, morphology, and lexicology, than the translator who translates into a foreign language. [18] hypothesises that increased proficiency in the medium of instruction (MI) is a prerequisite for successful instructional communication (IC), with the latter being required for higher cognitive processes, good effects, and better performance in the learning environment.

The study of [19] which aimed to examine how the use of the Mother Tongue as the language of instruction affects pupils' performance in mathematical problem solving found that The pretest and posttest mean knowledge comprehension scores of participants taught in Ilocano are higher than those of individuals educated in English. This means that when Ilocano is employed as a medium of teaching for mathematical problem solving, learners can quickly identify what is being asked and the data provided in the issue. It also shows that participants taught in Ilocano can identify the operation and what the problem requires, write out the number sentence in the problem, and solve the equation; however, participants taught in English have a higher posttest mean score than those taught in Ilocano. Correspondingly, the study of [20] conducted in the Philippines on the Effect of Mother Tongue-Based Education (Waray-Waray) in Teaching Mathematics Subjects Among Elementary Grade Pupils demonstrated that following the post-test, respondents' Mathematics achievement increased significantly for the experimental group and significantly for the control group, with the control group being more homogeneous in terms of their posttest scores. Respondents who received Mathematics instruction in English outperformed those who received Mother Tongue (Waray-Waray) mediated Mathematics instruction. Because English is the mother tongue at Samar College, students may face Waray-Waray mediated Mathematics education that is alien to them. As a result, it is recommended that English be used as the learner's mother tongue in Samar College Elementary Department to enhance the learner's understanding of the concept and that teachers explain the lessons in the learners' language, especially when the teacher notices that the students are having difficulty understanding the topic.

The study of [21] reveals that in Namibia, there are multiple indigenous languages and dialects spoken. Thirteen of these languages have standard orthography and are currently utilised as the medium of teaching in schools. Oshi-

wambo, Khoekhoegowab, Otjiherero, Silozi, Afrikaans, Rukwangali, Rumanyo, Thimbukushu, German, and Setswana are among these languages. [22] states children should be taught in their mother tongue for the first three years of school (Grades 1 - 3). According to the policy, education in the mother tongue, particularly in the lower grades, is critical for concept formation as well as literacy and numeracy success.

The study of [23] conducted in the Zambezi region of Namibia on The Impact of Silozi Language on the Teaching of Numeracy in the Zambezi Region examined the difficulties that lower primary numeracy teachers in the Zambezi Region have when utilising Silozi as a medium of instruction. The use of Silozi as a medium of instruction is part of Namibia's school language policy. Silozi, a Lingua Franca in the Zambezi Region, is widely spoken. According to the study's findings, teachers were unable to interpret curriculum concepts, and students were unable to express themselves using the lingua franca. When Numeracy questions were provided to the learners in symbolic form and in their home tongue, however, they had no difficulty understanding the questions.

The study of [24] emphasises the need to provide practitioners with the information and skills necessary to teach mathematics (subject and methodology) in early childhood. Early children's mathematical comprehension predicts their future achievement and early mathematics research reveals that a good foundation in mathematics learning and knowledge is the key to children's academic future success. Young children require accurate mathematics that is taught in an appropriate manner, taking the right methods and steps into account, in order to progress effectively. Many activities aimed at improving mathematics in the early years, according to [25], involve relating actual experiences to abstract concepts. If high-quality education is to be expected, teachers must be able to offer and influence young children with sufficient information and abilities through the application of their mathematical expertise.

It is above this premise that the researchers delved into undertaking a study that may benefit the language teachers who teach at the junior primary level and who instruct in the medium of their mother tongue. The current study examines the perspectives of grade 1 Rumanyo teachers in the Kavango East region of Namibia on teaching mathematics in the language of Rumanyo. The rationale for specifically focusing on teachers' perspectives is that the study's population is grade 1 which is a fundamental grade, and interviewing grade one learners instead of teachers in this grade may be unfruitful as grade one learners have just entered the school setting and they may not be well vested in knowing the language policy for schools in Namibia and tell if it is best to study all subjects in Rumanyo than English as the official language of Namibia. Moreover, the researchers believe the grade one teachers would be the right population to derive their perspectives of teaching all subjects in grade one in the medium of Rumanyo because they are teachers, and they could easily show disparities in teaching in the medium of Rumanyo by measuring results with those that teach in the medium of English in the same grade.

This study sought to answer the following research questions:

1) What are the perspectives of Rumanyo teachers in teaching mathematics in Rumanyo as the medium of instruction?

2) Is there a significant difference in learners' performance who are taught mathematics in the medium of Rumanyo and those taught mathematics in the medium of English?

2. Methods

This study adopted the mixed method research design, and it is framed in the constructivist theory. A mixed-method research design was adopted on the basis that when using mixed methods, rigor entails providing proof for the reliability and validity of the quantitative parts, as well as for the qualitative and quantitative results to be integrated for the entire project [26] [27].

The study's units were Rundu Circuit and Ndiyona Circuit, with eight selected schools per circuit offering Rumanyo language (RL) as a Medium of Instruction (MoI) in grade one in the Kavango East region. The sample size was purposively selected. The sample size consists of ten teachers, five management members and three advisory teachers in Kavango East Region (KER). Purposive sampling was used based on the following criteria: only grade 1 teachers with at least 1+ years of teaching experience, graduates from any colleges and from the University of Namibia and other institutions, teachers doing In-service Educational Training Teachers (INSET) doing Diploma in Junior Primary Education (DJPE) programme with the University of Namibia and teaching in the medium of Rumanyo, principals or head of department (HOD) at Primary Schools, and, Advisory Board members. These teachers and Advisory educators were chosen because they were thought to have relevant data about the influence of mother tongue on mathematics execution. Data was gathered using the focus group interview guide and a classroom observation checklist. Qualitative data were presented verbatim and in themes and a content analysis was used to analyse qualitative data, whereas quantitative data were presented in tables and graphs and used descriptive analysis to analyse data.

To evaluate trustworthiness, the questions used to gather data in this study were reviewed by an expert to ensure that they were related to the research aims, that they were not unclear, and that they were clearly understood by the participants. When interview questions were clearly outlined and the framework was meticulously created, the interview guide and consent form were delivered to participants prior to the actual interview.

3. Results and Discussion

The findings of the study are as follows.

3.1. Biographical Data of Teachers Who Participated in the Study

This graph illustrates the participation in the study of ten instructors from eight

different schools. The data also showed that only two teachers out of 10 were male, while eight teachers were female, giving us a 20% male to 80% female ratio. This indicates that female teachers are more prevalent in the first grade. Three instructors are in their thirties, six teachers are between 25 and 28 years old, one female teacher is 53 years old, more youthful teachers are teaching grade one with experience ranging from 4 to 16 years, and the elder teacher has greater teaching experience. (Table 1)

3.2. Demographics Characteristic of Management Members

Table 2 illustrates the demographics characteristic of Management Members.

Table 2 demonstrates that four management members fell within the 34 - 45 age range (90%) and only one was above 50. Three males and two females participated in the study. This implies that the management team members were mature, skilled, and of a productive age. But when it came to their credentials, three management had a BETD and two held a BED honours degree, which indicated that the majority of principals and HODs only had a diploma. This

Table 1. Depicts the biographical data of teachers who participated in the study.

Schools	Teachers coding	Gender	Ages	Teaching experience	Qualification
S1	T1	Female	30	10	BETD + ACE
S1	T2	Female	53	33	BETD
S2	T3	Female	27	10	BETD
S2	T4	Female	25	5	BED HONNORS
S3	T5	Male	28	16	BETD
S4	T6	Female	35	18	BETD
S5	T7	Female	26	6	INSET Student
S6	T8	Male	27	4	INSET Student
S7	T9	Female	28	6	INSET Student
S8	T10	Female	36	9	BETD

Table 2. Demographics characteristic of management members.

School	Management member	Gender	Ages	Teaching experience	Qualification
S1	MM1	Female	34	19	BETD
S3	MM2	Male	45	25	BED HONNORS
S5	MM3	Female	36	19	BETD
S7	MM4	Female	39	20	BED HONNORS
S8	MM5	Male	50	29	BETD

might be one of the assumptions that these educational differences also contribute to the difficulties encountered when teaching mathematics using MT; the more the management advances in their studies, the better they will be able to handle any changes made to the curriculum.

3.3. Demographics Characteristic of Advisory Teachers

3.3.1. The Gender of Advisory Teachers

Figure 1 illustrates that more than half of the advisory teachers who participated in the study were females.

3.3.2. Teaching Experience and Qualifications of Advisory Teachers

Table 3 shows the teaching experience and qualifications of advisory teachers. From the table, it may be deduced that the advisory teachers have sufficient experience in advising the Rumanyo teachers on how to use the mother tongue to teach mathematics in grade 1.

3.3.3. The Age of Advisory Teachers

Figure 2 depicts the advisory teachers in the late 30's and early to late 40's. This is a good age range, as they show that they are mature enough to advise the Rumanyo teachers on how to use the medium of Rumanyo to teach mathematics in grade 1.

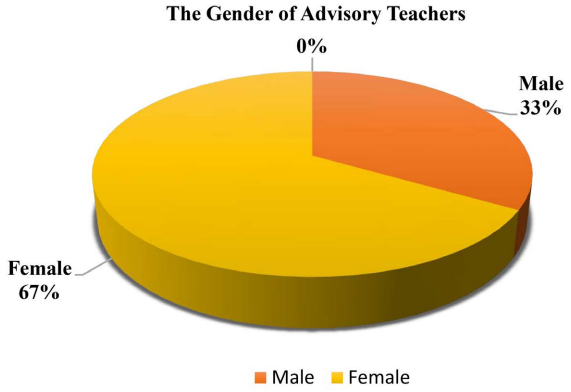

Figure 1. The gender of advisory teachers.

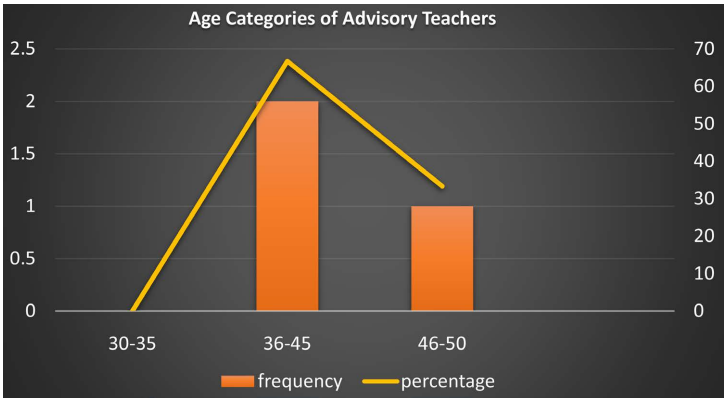

Figure 2. The age category of advisory teachers.

Table 3. The highest qualifications of advisory teachers.

	EXPERIENCE	QUALIFICATION
AT1	24	BED HONNORS
AT2	27	BED HONNORS
AT3	25	BED HONNORS

3.4. Teachers' Perception on MT Usage in Teaching Mathematics

One management member stressed that "MM4… *I have noticed that teaching in MT increases learners participation in the classroom and breaks the anxiety of believing that mathematics is a complex subject*" and one Advisory Teacher said: "*The whole idea of using MT as An instructional language in grade 1 is a good deal in most learning areas irrespective of some under or undeveloped concepts in some learning areas*, *specifically in Mathematics*". According to them teaching in MT enhances learners' understanding of the content and helps them develop mathematical vocabulary in their own language. This finding goes in line with the finding of Meşe and Sevilen (2021) who stated that learners have lower levels of motivation when they skip lessons or do not participate in activities due to a lack of interest in the language and subject matter. Furthermore, if students do not comprehend the language and are unable to fully participate in class, they will become discouraged and quit. He went on to say that this results in poor quality education, which frequently has an unfair impact on disadvantaged groups, as well as school and resource loss as students drop out or end up repeating the same level. The findings are further supported by the study of [9] who proposed that pupils' education begin with the language they are familiar with and comprehend well, as this will give a firm foundation and encouragement for school attendance. Mother Tongue as a teaching medium would allow elementary school students to immediately create and clarify, communicate their thoughts, and formulate new concepts to what they already knew without worry of making grammatical errors.

Even though, most respondents supported the idea of using RL as MOI in teaching mathematics for grade one, two teachers (T1 and T3) and two management members (M3 & M5) opposed the idea of using MT in teaching mathematics. They said: *"At our schools*, *we receive learners that are coming from Pre-primary schools where they utilize English as* the *dialect of instruction*, *so it is difficult for us to teach them in MT*, *thus our management decided to use English from* 1 - 3 (T1 & T3)". By saying this they further explained that even the parents agreed with the school management and wrote requesting a letter from the Ministry of Basic Education, Arts and Culture thru the regional Director to utilise English as MOI from Grades 1 - 3. And that was approved by the Ministry. These findings are upheld by [7] who disclosed that in multilingual postcolonial countries like Namibia, the medium of teaching is a critical problem in language education policy. Teachers have an important part in language

policy implementation, and their beliefs have an impact on it. As a result, it is critical to investigate their attitudes towards language education policy and its implementation. It should be noted that teaching maths in the student's home language also causes difficulties for many students.

3.5. The Importance of Using Mother Tongue to Teach Mathematics in Grade 1

Various definitions of mother tongue exist, and they change over time to take into account the subtleties of how different people use language. One widely accepted explanation is that it describes the language a person picks up from their early contacts with family and society [28]. The participants were questioned regarding the benefits of utilising MT in first-grade maths instruction. As one of the teachers (T3) put it, "*It develops mutual understanding between teachers and learners.*" *The respondents from the focus group discussion panel* (*FGDP*) *confidently explained that the usage of MT as a MOI has various advantages. With the use of MT, or Rumanyo language in this instance, vocabulary for mathematics is developed, making it simpler for learners to understand concepts like problem-solving, calculation, counting, fractions, and measuring."* This result is in agreement with the study of [10] that aimed at determining the effectiveness of mother tongue-based as a medium of instruction in teaching Mathematics in Grade 1 classes revealing that using the Waray mother tongue to teach basic number concepts and operations helps to lay a solid foundation for comprehending and learning higher mathematics.

AT1… "*I observed during school visits there is a great communication flow between teachers and learners when they use MT to teach mathematics, especially in counting numbers.*" At this point, the participant was expressing the functionality of MT as it is used to make explanations clearer and more understood by the learners. These findings are affirmed by The study of [9] that mother tongue as a teaching medium would allow elementary school students to immediately create and clarify, communicate their thoughts, and formulate new concepts to what they already knew without worry of making grammatical errors.

All in all, the following conclusions were drawn from the study: teachers have different perspectives on using mathematics as a medium of instruction to teach mathematics in the junior primary phase. The findings reveal that the use of Rumanyo as a mother tongue to teach mathematics in grade 1 is important because it promotes great communication flow between teachers and learners, it enhances mathematics vocabularies in the Rumanyo language. However, teaching mathematics in Rumanyo may also hinder the performance of some learners who were taught in the medium of English at the pre-primary level. Against these findings, the study proposes that another study should be conducted to establish the perspectives of student teachers who are being trained to teach mathematics in the junior primary phase in the medium of Rumanyo and identify the dependent and independent variables associated with the challenges and successes of teaching mathematics in the medium f mother tongue and develop a

framework to ease the tension of mother tongue instruction of mathematics.

Conflicts of Interest

The authors declare no conflicts of interest.

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