Implementation of Indigenous Language Policy for Basic Science and Mathematics in Niger State, Nigeria: Challenges and Prospects

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Abstract: *This study examined the challenges associated with the implementation of the indigenous language policy for teaching basic science and mathematics in Niger State, Nigeria. The study also considered the prospects and provided key recommendations for improvement. A total of 383 primary school teachers from the 3 senatorial zones of Niger State were sampled from private, public, rural, and urban schools for the study. A researcher-prepared questionnaire was used to collect the needed data and was validated by experts and teachers and obtained a 0.88 reliability index using Cronbach Alpha. Data collected was analyzed using percentages and average weighted responses. The study reveals significant challenges, including a lack of resources, teacher fluency, and difficulty translating complex scientific concepts. It further revealed that the policy offers prospects such as improved student engagement, cultural preservation, and inclusivity. Recommendations include increasing teaching resources, enhancing teacher training, developing localized curricula, fostering community support, and implementing regular evaluations.*
Keywords: indigenous language, science, mathematics, challenges, prospects

INTRODUCTION

The National Policy on Education (FRN, 2013) mandates that the first three years of basic education be taught in the mother tongue or the language of the immediate community, and that every child should learn one Nigerian language. Fafunwa et al. (1989) supported this, recommending mother tongue instruction for the first 12 years of a child's life. While this

policy is not new, it still raises many questions. Nigeria inherited a colonial education system from the British, which mandated English as the medium of instruction at all educational levels. This trend is common in many African countries, where the English language policy has marginalized the use of indigenous African languages in education (Ntuli & Mudau, 2024). English remains the prestigious language, while indigenous languages hold lower status. Fafunwa et al. (1998) attributed the continued use of English as the official language to a colonial mind-set, emphasizing that early education in a child's mother tongue is more likely to have a lasting impact on memory.

The use of indigenous languages in education, particularly in early years and for core subjects especially basic science and mathematics, is a global topic of debate. The United Nations Educational, Scientific and Cultural Organization (UNESCO) promotes mother tongue-based multilingual education for better learning outcomes and cultural preservation (UNESCO, 2019). Nigeria's National Policy on Education mandates the use of local languages in early basic education with the aim of bridging the home-school gap and improve understanding of fundamental concepts (Bamgbose, 2014). Niger State, a North Central Nigerian region with over 20 indigenous languages, offers a rich linguistic landscape. This linguistic richness presents both opportunities and challenges in the implementation of educational policies, particularly in the fields of basic science and mathematics (Babatunde, 2020).

Several studies show that students perform better when taught in their mother tongue (Oginni & Owolabi, 2013). For example, Osungbemiro et al. (2013) found that using Yoruba in biology instruction led to higher student achievement. Niyi et al. (2018) noted that teaching mathematics in a child's native language makes mathematical concepts more accessible, helps develop mathematical vocabulary, and aids non-English-speaking adults in understanding the subject. The mother-tongue policy has garnered significant support from parents, teachers, and non-governmental organizations, which are urged to contribute to the advancement of indigenous language literature (Tsaure & Sani, 2024).

Despite the recognized benefits, the implementation of this policy remains insufficient in many schools (Abijo, 2011). Teachers are central to enforcing the policy, but they must be proficient in the community's language and willing to apply the policy. Adewale (2011) attributes the challenges in Nigerian students' mathematics achievement to teachers' inability to teach the subject meaningfully. Niyi et al. (2018) emphasizes that teachers are key to transforming mathematics education, and teaching in the mother tongue could be a solution.

This study seeks to explore the specific challenges faced by teachers in Niger State as they adhere to the National Policy on Education's language requirement. The study also seeks to know if teachers this there are any prospects for the use of indigenous languages in teaching basic science and mathematics in Niger state. By examining these challenges, the research aims to provide insights into the practical implications of mother-tongue instruction in science and mathematics and offer recommendations for improving teaching strategies to enhance learning outcomes at the lower basic level.

Statement of the Problem

The National Policy on Education in Nigeria mandates that the language of instruction in the first three years of primary education should be the language of the immediate community (Federal Republic of Nigeria, 2013). This policy aims to ensure that children develop literacy and numeracy skills in a language they are familiar with, promoting better comprehension and academic success. However, while the policy holds theoretical promise, its practical implementation, particularly in teaching technical subjects like basic science and mathematics, presents significant challenges. This presents a significant language barrier for pupils who are more proficient in the indigenous language and teachers who do not have instructional materials for teaching in the indigenous language. This situation has resulted in a decline in academic performance and an increase in dropout rates, particularly among pupils from low-income households who live in rural areas.

Given these challenges, it is essential to investigate the specific obstacles faced by teachers in Niger State in delivering basic science and mathematics instruction in the indigenous language. By identifying these barriers, this study aims to contribute to the growing body of research on language of instruction and provide recommendations for improving the quality of education in multilingual and rural settings where most of the pupils speak only the indigenous language of the immediate environment.

Research Questions

These research questions will guide the investigation into the challenges of teaching basic science and mathematics in the indigenous language in Niger State.

1. Are teachers in Niger State aware and knowledgeable about the indigenous language policy?
2. What are the major challenges faced by teachers in Niger State in delivering basic science and mathematics instruction in the indigenous language?
3. What is the attitude of teachers towards the teaching of basic science and mathematics in the indigenous language?
4. What are the prospects of teaching basic science and mathematics in the indigenous language?

RESEARCH METHODOLOGY

A descriptive research design was employed for the study. The target population was primary school teachers at the lower basic level in Niger State. The research design incorporates both quantitative and qualitative elements, using a structured questionnaire with a 4-point Likert scale and qualitative data collection through classroom observations and a checklist for teaching materials. This mixed-method approach ensures a comprehensive view of the challenges by capturing both numerical data and in-depth experiences from teachers.

The target population consists of lower basic school teachers (primary 1-3) responsible for teaching basic science and mathematics in the indigenous language in Niger State. A sample size of 383 teachers was drawn from the three senatorial zones of Niger State using

stratified random sampling to ensure broad representation. This sample size is based on Krejcie and Morgan's (1970) formula for determining sample sizes in large populations.
A structured questionnaire tagged "Indigenous Language for Teaching Lower Basic Science & Mathematics Questionnaire (ILTLSMQ)" was administered to teachers to collect quantitative data on the challenges they face in teaching these subjects in the indigenous language. Three hundred and eighty-three (383) properly filled questionnaires were retrieved from the three senatorial zones of the state. The questionnaire used a 4-point Likert scale with options ranging from 1 (strongly disagree) to 4 (strongly agree).

Data Collection and Analysis
The data collection process began with the distribution of questionnaires to over 400 lower basic teachers in the 3 senatorial zones of the state, who will be given sufficient time to complete them. Following this, the checklist was used during visits to the schools to assess available teaching materials.

For data analysis, quantitative data from the questionnaire was analyzed using descriptive statistics such as mean, standard deviation, and frequency distribution. To ensure the study's validity and reliability, the questionnaire was pilot-tested on a smaller sample to ensure the clarity and relevance of the questions. Content validity was ensured by having experts review the instruments, and reliability was assessed using Cronbach's alpha to test the internal consistency of the Likert scale items and yielded a reliability quotient of 0.88. Ethical considerations were observed throughout the research process. Informed consent will be obtained from all participants, and they were assured of the confidentiality and anonymity of their responses. Participants will also be informed of their right to withdraw from the study at any time. Data will be securely collected and stored, with access limited to the research team.

RESULTS

The results obtained from the analysis of data gathered in the study provided the basis for answering the research questions.
Research Question 1
Are teachers in Niger State aware and knowledgeable about the indigenous language policy?

Table 1: Aware and knowledgeable about the indigenous language policy

SN	ITEM – Knowledge	SA (%)	A (%)	D (%)	SD (%)	AWR
1	I am aware of the indigenous language policy for lower basic education in Nigeria.	144 (38%)	192 (50%)	31 (8%)	16 (4%)	3.21
2	I have all the needed information on the indigenous language policy for lower basic education in Nigeria.	70 (18%)	192 (50%)	92 (24%)	29 (8%)	2.79
3	I have received orientation and training on teaching basic science and mathematics using indigenous language.	79 (21%)	150 (39%)	99 (26%)	55 (14%)	2.66
4	I understand the benefits of teaching mathematics and science using indigenous language.	159 (42%)	168 (44%)	44 (11%)	12 (3%)	3.24
5	I am fluent in the indigenous language of my school's locality.	153 (40%)	138 (36%)	64 (17%)	28 (7%)	3.09
6	Most of the pupils (more than 70%) understand the indigenous language.	186 (49%)	151 (39%)	34 (9%)	12 (3%)	3.33

From Tavle 1, the highest (AWR = 3.33) is related to the understanding that most pupils comprehend the indigenous language used in their school's locality, indicating a strong alignment between student language proficiency and the policy's goals. However, the relatively lower (AWR = 2.66) for receiving orientation and training suggests that many educators feel underprepared to teach basic science and mathematics using indigenous languages. This points to a gap in professional development, which may hinder effective implementation of the language policy.

Furthermore, while teachers understand the benefits of using indigenous languages (AWR = 3.24) and are largely aware of the language policy (AWR = 3.21), a significant portion does not feel they have all the necessary information (AWR = 2.79), which could affect their confidence and ability to fully support the policy. The overall results highlight that while teachers are generally supportive of the policy and its benefits, there are clear areas, particularly in terms of training and information dissemination, that need to be addressed to ensure successful implementation.

Research Question 2
What are the major challenges faced by teachers in Niger State in delivering basic science and mathematics instruction in the indigenous language language?

Table 2: **Challenges of teaching basic science and mathematics using the indigenous language**

SN	ITEM: Challenges of Language Policy	SA	A	D	SD	AWR
1	Lack of books and manuals	188 (49%)	140 (37%)	31 (8%)	24 (6%)	3.28
2	Some teachers may not be familiar with the indigenous language.	102 (27%)	189 (49%)	69 (18%)	23 (6%)	2.97
3	Some concepts cannot easily be translated into the indigenous language.	137 (36%)	151 (39%)	51 (13%)	44 (11%)	2.99
4	All words in basic science and mathematics cannot be translated into the indigenous language.	126 (33%)	124 (32%)	94 (25%)	39 (10%)	2.88
5	There are not enough teachers to implement the policy in your school.	107 (28%)	148 (39%)	93 (24%)	35 (9%)	2.85
6	Parents would not support the policy.	81 (21%)	115 (30%)	120 (31%)	67 (17)	2.55
7	The community will not support the policy.	92 (24%)	95 (25%)	139 (36%)	57 (15%)	2.58

The data indicates that the most significant challenge identified is the lack of books and manuals (AWR = 3.28), suggesting a pressing need for educational materials in indigenous languages. Other major concerns include the difficulty in translating some concepts (AWR = 2.99) and teacher unfamiliarity with indigenous languages (AWR = 2.97). These findings highlight the resource and training gaps that need to be addressed for successful policy implementation. Parental and community support for the policy also scored lower (AWRs = 2.55 and 2.58), signalling potential resistance from these groups. This suggests that more community engagement and education are necessary to gain broader acceptance of the language policy.

The overall results suggest that while there is acknowledgement of the challenges associated with implementing the indigenous language policy, addressing these logistical and societal hurdles is crucial to ensuring the policy's success.

3. What are the prospects of teaching basic science and mathematics in the indigenous language?

Table 3: **Prospects of teaching basic science and mathematics using the indigenous language**

SN	ITEM: Prospects of Language Policy	SA	A	D	SD	AWR
1	Teaching basic science and mathematics using indigenous language will promote cultural preservation and identity.	214 (56%)	129 (34%)	30 (8%)	10 (3%)	3.43
2	Teaching basic science and mathematics using indigenous language enhances students' understanding and engagement with mathematical concepts.	161 (42%)	186 (49%)	29 (8%)	7 (2%)	3.31
3	By teaching in indigenous language, community involvement and support for basic science and mathematics will be strengthened.	137 (36%)	193 (50%)	42 (11%)	11 (3%)	3.19
4	The policy will make basic science and mathematics more accessible to students from diverse linguistic backgrounds.	115 (30%)	194 (51%)	52 (14%)	22 (6%)	3.05
5	The policy will foster inclusivity and equity in education.	132 (34%)	177 (46%)	59 (15%)	15 (4%)	3.11

The data shows strong support for the use of indigenous languages in teaching science and mathematics. The highest average weighted response (3.43) reflects a positive outlook on promoting cultural preservation and identity. Additionally, there is significant agreement that this approach enhances student understanding and engagement (3.31) and strengthens community involvement (3.19), and policy will foster inclusivity and equity in education (3.11). Overall, the majority of respondents express strong support for the policy, highlighting its positive impact on accessibility, inclusivity, and equity in education.

DISCUSSION

Based on the analyses conducted today, several key insights have emerged regarding the prospects, challenges, and knowledge of the indigenous language policy for teaching basic science and mathematics in Nigeria. First, the overall sentiment among teachers is positive regarding the prospects of the language policy, with a high average weighted response reflecting their belief that teaching in indigenous languages will promote cultural preservation, enhance understanding and engagement, and foster inclusivity in education. Teachers generally agree that using indigenous languages can improve student participation, reduce anxiety, and make the subjects more accessible to students from diverse backgrounds, which is in tandem with Niyi et al. (2018) and Golafshani (2023).
However, several challenges have been identified. The availability of teaching resources such as books and manuals in indigenous languages remains a significant issue. Additionally, some teachers are concerned about their own fluency in indigenous languages and the ability to translate complex scientific and mathematical concepts effectively (Lopez et al., 2020; Nahole & Haimbodi, 2022). These challenges suggest that while the policy is supported in theory, practical barriers to implementation exist, particularly in urban and heterogeneous environments.

When it comes to knowledge and preparedness, most teachers are aware of the policy and understand its benefits, but there are gaps in orientation and training. The relatively low average weighted response for receiving sufficient training highlights the need for more professional development to equip teachers with the necessary skills and confidence to implement the policy effectively (Ojoo & Moyi, 2022). The perception that pupils comprehend the indigenous language of instruction further underscores the policy's potential success if these challenges are addressed (Akinkoutu et al., 2022).

CONCLUSION

While the indigenous language policy for teaching basic science and mathematics in Niger State is widely supported by teachers, successful implementation will require addressing resource limitations, enhancing teacher training, and ensuring that materials and curricular support are available. Without overcoming these obstacles, the full benefits of the policy, improving student outcomes and preserving cultural identity, may not be fully realized in Niger State.

Recommendations

Based on the analysis of the indigenous language policy for teaching basic science and mathematics in Nigeria, five key recommendations are proposed:

1. Increase teaching resources by developing and distributing books and manuals for teaching basic science and mathematics in indigenous languages, ensuring accurate translations of complex concepts.
2. Provide comprehensive teacher training to improve fluency in indigenous languages and teaching strategies.
3. Develop indigenous language-friendly curricula to make scientific and mathematical concepts culturally relevant and understandable.
4. Strengthen community and parental engagement by educating them on the benefits of the policy to foster support.
5. Monitor and evaluate implementation progress through regular feedback from teachers, students, and parents.

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