

Feyi Ademola-Adeoye  
(University of Lagos)

## Deploying indigenous Nigerian languages for communicating scientific knowledge: Issues, challenges, and prospects

### Abstract

Language is a vital component of indigenous knowledge, embodying identity and culture. Indigenous languages transmit values and beliefs across generations, and their use in education is crucial to achieving holistic national development. The mother tongue, regarded as the primary code for perceiving reality (Prah 1995; Emenanjo 1996; Skutnabb-Kangas 2000; van Pinxteren 2022), facilitates the understanding of abstract scientific concepts, enabling learners to interpret reality effectively. Research by the World Bank and UNESCO shows that learning outcomes improve significantly when instruction is delivered in the mother tongue. Countries that rank highly in mathematics and science often invest in teaching these subjects through local languages. This paper explores the challenges of using indigenous languages to communicate scientific knowledge in Nigerian schools. Findings reveal persistent obstacles such as ideologically-driven language policies, weak implementation, negative speaker attitudes, the multiplicity of indigenous languages, low proficiency, inadequate documentation, shortage of qualified teachers, poor remuneration, limited funding, and the dominance of English, which subordinates local languages. Efforts to address these issues include initiatives by the National Institute for Cultural Orientation (NICO) to promote indigenous languages and inter-agency panels advocating their use in teaching mathematics and science. However, policy implementation remains weak. For indigenous languages to function effectively in education, government must enforce policies mandating the compulsory learning of at least one indigenous language in schools.

**Keywords:** Education, Indigenous Nigerian languages, Mother Tongue, Scientific Knowledge

## **Introduction**

Before the colonial era, local languages flourished and the people's cultural values were promoted. English was first introduced into Nigeria in the 16<sup>th</sup> century by European traders. Later in the 18<sup>th</sup> century, it was adopted by the missionaries, who also taught it to their converts to facilitate the work of evangelisation. In the 19<sup>th</sup> century, when the British assumed control of Nigeria, English became the colonial language and, later in the 20<sup>th</sup> century, the official language. One of the major problems confronting Nigeria is the multiplicity of languages. Unstable language policy, the inability of Government to decide on the local language to use as the official language, failure to codify languages spoken by a minority of the population, non-delineation of roles for local language use in governance, etc., are some of the other critical factors surrounding the crisis. Although Nigeria has over 540 indigenous languages (Olatunde-Ojo et al. 2022; National Language Policy (NLP) 2022: 2), none of the languages has been considered worthy of adoption as a national language. In the 1990s, an attempt was made to popularise an artificial language (WAZO-BIA), similar to Esperanto. The effort, however, failed because the language derived most of its words and vocabulary from the three major languages, namely Yoruba (WA), Hausa (ZO), and Igbo (BIA) (the verbs for "come" in these languages), to the exclusion of other languages. Consequently, the English Language has continued to assume greater importance in the country due to its indispensability, as its use cuts across different spheres of our national life. At the same time, the growth of the over 500 indigenous languages in Nigeria has been suppressed (Ajepe/Ademowo 2016).

## **The nexus between indigenous languages, local knowledge, and culture**

From a pedagogical perspective, using local languages in education enhances children's learning within the classroom and plays a vital role in sustaining cultural and social values beyond the classroom. This duality of purpose manifests in several examples from Asia and the Pacific countries, known as two of the world's most biologically and linguis-

tically divergent regions. In Nunavut (Canada), schools use Inuktitut through early grades, integrating it into curricula (kindergarten to Grade 3 or 4) alongside English or French. This bilingual education improves comprehension, enabling students to grasp abstract and scientific concepts in their mother tongue (pedagogical benefit), while preserving Inuit language, worldview, and identity. Community elders, storytelling, and Inuit societal values are woven into teaching, helping students maintain cultural continuity beyond school (MacDonald 2023; Tulloch et al. 2009).

Similarly, Papua New Guinea, with about 840 languages and roughly 5% of the world's biodiversity, is currently using local languages and knowledge to help boost children's language skills and biodiversity knowledge (Sudoh/Darr 2022). A number of researches (Sibayan 1968; 1978; Badejo 1989; Fafunwa et al. 1989) have shown that the use of the mother tongue, especially in early childhood education, can significantly improve the quality of learning, learning outcomes, and academic performance of learners. It also prevents knowledge gaps and increases the speed of learning and comprehension. Other benefits of multilingual mother tongue-based education include the empowerment of all learners for full participation in society, the promotion of mutual understanding and respect for one another, and the preservation of the rich deposit of cultural and traditional heritage found in all languages across the world.

Local languages are embedded with the culture and heritage of the people who speak them. Therefore, the government should protect and promote their use in teaching and learning so that the next generation can understand and develop a link with their environment and acquire the necessary biodiversity knowledge and language skills to proffer solutions to diverse environmental and climatic problems (Sudoh/Darr 2022). In his address marking International Mother Language Day on 20 February 2023, David Atchoarena, Director of the UNESCO Institute for Lifelong Learning, underscored the pivotal role of mother-tongue education in sustaining both knowledge systems and cultural heritage. He argued that education delivered in learners' first languages is not only central to the transmission of traditional knowledge and values but also to the provision of meaningful and contextually relevant learning opportunities across age groups. Importantly, Atchoarena highlighted that empirical evidence demonstrates how such provision strengthens edu-

educational outcomes while fostering learners' confidence and self-esteem (Atchoarena 2023).

According to Ademowo (2016), innovation (and technological advancement) is galvanized by the application of human knowledge acquired in the form of skills, pure theoretical knowledge, and techniques. Unfortunately, Africans find it difficult to fully comprehend the theories because the theories are rendered in foreign languages. In many African countries (including Nigeria), the languages of science and technology are still colonial, foreign languages such as English, French, and Portuguese. Indigenous languages are not prioritised in the transmission of ideas despite their proven ability to enhance cognitive understanding in learning. Japan is a good example of a country that has realised this indubitable fact. In less than fifty years, Japan, once referred to as a third-world country, is now one of the most technologically advanced countries in the world by reason of their knowledge of science and technology, a feat achieved through the development and use of techno-scientific terms in local languages.

It is believed that "Ifa" the Yoruba system of divination and philosophical knowledge centred on the deity Orunmila (Abimbola 1976; Francis/Olojo-Kosoko 2024), has existed in West Africa for thousands of years prior to the advent of Christianity, Islam, and the computer age. There is currently an abundance of literature that indicates that there are considerable commonalities between the computer and Ifa divination. While the average contemporary African might want to consider it as an antiquated memento of years gone by, foreigners are publicising it as a critical aspect of the latest technological development. If the unique numeric system of the "Odu" (the foundation of Ifa divination) which bears a striking resemblance to the binary language of computers can be expressed in foreign languages, nothing should prevent Africans (including Nigerians) from using their languages to teach Chemistry and other science subjects.

One of the implications of relegating indigenous languages to the background is that they face the threat of language extinction, language shift, or, ultimately, language death. A language that is not spoken eventually dies. Language and culture cannot be separated; therefore, the lack of use of indigenous languages by the younger generation has led to the gradual erosion of our cultures. The result of this is that the younger gen-

eration is beginning to lose the core values and virtues in their cultures. The dress culture of the younger generation is also taking after the dress culture of the people whose language they speak. The younger generation reflects the culture of the language they speak more by gradually modifying their names to be pronounceable in English: Ola written as Horllar, Femi as Phemmy, etc. (Ajepe/Ademowo 2016).

### **The effectiveness of the mother-tongue/indigenous languages for educational purposes**

The idea that instruction in education is best given in a child's mother tongue is not new. In 1920, an American philanthropic organization set up a commission (the Phelps-Stoke Commission) to study education in Africa. In its 1922 report, the Phelps-Stoke Commission recommended, among other things, the use of the "tribal language" in the lower primary classes and "the language of the European nation in control" in the upper classes (Iwara 1981: 96–98). The idea of beginning primary education in the mother tongue further received strong support when education and language specialists met in 1951 under the sponsorship of UNESCO. Their report, published in 1953, recommended that learners should be taught at the beginning of their education in their mother tongue and that this practice should be extended to as late a stage in the education system as possible:

It is axiomatic that the best medium for teaching a child is his mother tongue. Psychologically, it is the system of meaningful signs that, in the mind, work automatically for expression and understanding. Sociologically, it is a means of identification among the members of the community to which he belongs. Educationally, he learns more quickly through it than through an unfamiliar linguistic medium (UNESCO 1953: 11, cited in Iwara 2008: 29).

Subsequent meetings of UNESCO experts have reaffirmed this point of view. These ideas about mother-tongue language-based education became so popular that they formed the object of several experiments. One of the best-known studies, the Iloilo Experiment, yielded results that appeared to conclusively demonstrate the superiority and effectiveness of the mother tongue for educational purposes. It showed that teaching learners in the first two years of primary school in the local

language, Hiligaynon, was much more effective than teaching in English and that even when the language of instruction changed to English in the third year, the superiority of the mother language medium of instruction remained in the sense that the experimental group continued to surpass the control group in terms of academic performance (Iwara 2008: 29). Another experiment in Ghana showed that primary school children had a richer vocabulary in their mother tongue than in English. The implication was that, for those children, English would be a less efficient medium of instruction than their mother tongue (Bamgbose 1976: 12; Dakin 1968: 28).

The Six-Year Primary Project embarked upon by the Nigerian Government in collaboration with the Ford Foundation involved the use of Yoruba as the medium of instruction for the entire six years of primary education, with English taught as a subject or second language by specialist teachers. Like the Iloilo experiment, pupils who were taught with Yoruba at the primary school level performed better than their counterparts who were taught all subjects in English language. As opined by Fafunwa (1983: 395), “the child learns better in his mother tongue, and his mother tongue is as natural to him as his mother’s milk.”

According to Kioko (2015), early mother tongue education can aid comprehension of the curriculum content and improve pupils’ attitudes towards learning. Also, when pupils receive instructions in their mother tongue or a language they already speak and understand very well, they are able to express themselves freely and confidently and participate better in the process of learning. Through this interactive learner-centered approach, suggestions are made, questions are asked, answers are provided to questions, and new knowledge is created and conveyed by the learners with excitement. Consequently, the confidence of learners is boosted, and their cultural identity is affirmed. This invariably impacts positively on learners’ perception of the importance of learning to their lives. However, teaching pupils in a language that is relatively new or unknown to them results in a teacher-centered approach, which will make learners passive and quiet in classrooms.

Reading and writing skills are developed faster when learners are taught in a language that they speak or understand rather than being taught in a foreign language such as English. Learners are usually enthusiastic when they are able to comprehend written texts and can write the

names of people and things in their environment. Kioko (2015) further explains that Research in Early Grade Reading (EGRA) has shown that the ability of learners to acquire reading skills early gives them an edge in school as skills and concepts taught in the learners' native language do not have to be taught again when learners are ready to learn a second language. Learners who are proficient in reading and writing in their mother tongue acquire the ability to read and write in a new language more quickly. Using an indigenous language to teach school children also reduces the stress of the teacher as long as she can speak that language. Research has also shown that where the language of instruction is not the mother tongue of both the teacher and the learner, the teacher struggles just as much as the learners, especially at the beginning of schooling. However, the teaching-learning process is more spontaneous and more comfortable when it begins in the teachers' and learners' native language. This enables the teacher to be more imaginative and think outside the box in designing teaching/learning materials and approaches, resulting in improved learning outcomes.

### **Issues and challenges involved in the use of indigenous languages for communicating scientific knowledge in schools in Nigeria**

Although it has been over six decades since Nigeria gained independence, the country is yet to have an implementable language policy. Over the years, Nigeria's language policy has not only gone through a cycle of adoption, rejection, and re-adoption, it has been criticized for being inconsistent, fueling series of debates on language-related policies in primary and secondary education (Brann 1980; Emenanjo 1985; Olaoye 2002). The new National Language Policy (2022) recently approved by the federal government stipulates that the Mother Tongue (MT) or the language of the immediate community (LIC) be used as the medium of instruction from Early Childhood Care and Development Education to the six years of primary education. This has raised diverse concerns including the apprehension that the language spoken by teachers may be different from that of the majority of pupils, particularly in urban areas such as Lagos; classrooms may have pupils from diverse linguistic

backgrounds, making it challenging to have a single language of instruction that caters to all. Furthermore, in terms of languages spoken, four out of the six geo-political zones (the North Central, North East, North West and South South zones) are heterogeneous (NLP 2022: 2). In other words, in many of the states in these heterogeneous zones, none of the languages widely used seems universally suitable as medium of instruction for primary education, thereby raising questions about inclusivity. Concerns have also been expressed that many of the languages specified in the new policy are not sufficiently developed for literary use, which will potentially affect the effectiveness of the language of instruction (Tsaure/Sani 2024: 34). Nigeria is a multilingual nation with over 500 indigenous languages spoken by 250 ethnic groups. However, only about 65 have standardized orthographies, with just three languages – Hausa, Igbo, and Yoruba – recognized as major indigenous languages (Gbenedio 2010; Oyinloye 2010). Musa (2010) also identifies lack of adequate vocabulary as one of the challenges associated with some indigenous languages in the country.

The linguistic diversity of the nation has hindered the development of Nigerian indigenous languages to the advantage of English, whose prominence and influence has continued to grow. According to Bamgbose (1989), multilingualism can be a resource and a problem. As a resource, it makes more languages available to the public and increases the potential for language learning. On the other hand, as a problem, it has divisive potential and, with special reference to education, leads to challenges in the area of provision of learning materials in more than one language medium. Multilingualism, which should ordinarily protect the indigenous languages and ensure diversity through the various cultures, has become a serious challenge affecting all facets of life. Today, only three languages – Hausa, Igbo, and Yoruba – out of more than 500 in Nigeria are officially recognised as major languages, while the rest are classified as minority languages. This limited recognition reflects the sensitivity of language adoption in a highly multilingual nation, where elevating one language over others can easily generate political and cultural tensions. When a language is given more roles or prominence, others begin to feel envious, just as we have in Nigeria, thus making it impossible, so far, to pick an indigenous language as a *lingua franca*. In the words of Schwarz, cited in Bamgbose (1991a: 39), differences between indigenous

languages keep the people apart, perpetuate ethnic hostilities, weaken national loyalties, and increase the danger of separatist sentiment. Adegbija (1994: 150) also believes that deep-rooted mutual suspicions result in prejudice, stereotypes, and subtle linguistic hostility among various linguistic groups in Nigeria.

Even though the Nigerian Language Policy gives room for the use of indigenous languages, in practice, the English language is the language of governance in Nigeria. Due to the Government's perception of English as a world language or global *lingua franca*, most of the government business in Nigeria is conducted in English. Also, contrary to the recommendations in section 18 of the National Language Policy (2022: 17), English is the language of education in Nigeria from kindergarten to university. As a matter of fact, many schools in Nigeria prefer not to offer any indigenous languages in their curriculum. Many of such schools erroneously believe that using the English language as the language of instruction right from kindergarten gives the pupils a better foundation in the English language (Ademowo 2016).

Similarly, many Nigerian parents in urban areas speak English or one of the dominant languages to their children, hoping to create better social and economic opportunities for them. While some parents would love their children to be able to speak their indigenous languages, they are equally more concerned with the education and future of these children, which is tied to high proficiency in the English language. If, at every point in life, the criterion for measuring success and social status is the English language, then it should not come as a surprise that many parents have chosen to start promoting English language proficiency at a very early stage of their children's childhood, since it is the language with which they will be expected to function for the rest of their schooling and working lives. Educated parents who know that a child is capable of acquiring many languages before age 12 would rather have the child learn, first, the language that appears most functional in the society, which is English. Proficiency in English is widely associated with career advancement and social mobility. Since individuals function within interconnected social structures, what might otherwise be an advantage – the acquisition and application of mother tongue competence – can become a disadvantage if society does not actively support its widespread use. English proficiency is often perceived as a gateway to opportunities and as a marker

of prestige in virtually every domain where it is displayed. According to Orji and Udeze (2021: 117), the dominant attitude towards indigenous Nigerian languages, particularly among the Igbo, has frequently been one of neglect and even disdain, especially in educational settings. Many speakers express embarrassment at using their indigenous languages in public, assuming that exclusive reliance on English signifies education, sophistication, and modernity. For such individuals, English extends beyond a communicative tool to embody the perceived foundation of patriotism, employability, and long-term security for both themselves and their children.

Consequently, we now have a generation of Nigerian children who are unable to communicate with their grandparents in their mother tongue. As the youth migrate from the rural to urban centres in search of 'greener pastures,' they adopt the language of convenience in the cities. As a result, there is no local language transfer from the older generation to the youths. With time, the elders die without passing down the language to the next generation. Language is lost, and cultural values and ethical principles embedded in the language are also forgotten.

Another challenge to using indigenous languages in Nigeria is the paucity of teachers trained in using local languages. The so-called major (indigenous) languages have not significantly thrived in education beyond their geographical boundaries because of the obvious lack of teachers to teach them in schools (Udosen 2013). Similarly, minority languages have not made any appreciable impact even within their domains because of the native speakers' attitude to their language, among other things (Udosen 2002). The underdeveloped writing systems of many Nigerian languages also present a major obstacle to their effective use as mediums of instruction in education.

Another problem is the inferiority complex and mentality of the African elite, who falsely consider everything Euro-American as superior to anything African. As a result of this negative mentality, indigenous African languages are perceived as backward (Wa Mberia 2015: 53), and lacking the capacity to communicate technological and scientific concepts. The fact that there are African languages in Ethiopia and Eritrea that have a long history of writing systems that can easily be used to convey extremely technical and abstract ideas, as well as the existence of Leopold Senghor's translation of Einstein's Theory of Relativity into

Wolof, a lingua franca of Senegal, has proven this derogatory assumption to be an obvious misconception. One possible reason for many citizens' negative attitude towards the use of indigenous languages is the government's lack of success in implementing the policy of using local languages in the first three years of primary education. Most Nigerians have never observed or participated in contexts where local languages are used as a medium of teaching in schools, and when they observe their use in informal contexts, very little importance is attached to these languages. Many Nigerians will readily allow artisans who have acquired their knowledge through the use of local languages to repair their cars and automatic devices but will resist the idea of having their children taught in school in any of the indigenous languages.

Other plausible reasons advanced by Yusuff (2022) for the decline in the use of indigenous languages in Nigeria include migration to urban locations. If the parents' languages are not spoken at home, the children end up acquiring the language of popular use among multilingual speakers. In addition, when parents from different linguistic backgrounds fail to speak their individual languages or use a common indigenous one at home, a language of convenience is readily preferred. This reduces the use of indigenous languages by the couple and, by extension, the children. The fact that instruction manuals for modern gadgets like electronic media, phones, and games are mostly presented in English for wide acceptability and economic gains also discourages the use of indigenous languages. There is also the problem of displacement. As a result of war, inter-ethnic conflicts, and terrorism, the languages of the most populous members of Internally Displaced People (IDP) camps may endanger other minority languages, especially in the face of scarce and limited resources as the most popular language becomes the language of negotiation.

## **Efforts to promote the use of indigenous languages in Nigeria**

As part of its mandate to promote indigenous languages, the Federal Government established the National Institute for Cultural Orientation (NICO) under Act 93 of 1993. A joint initiative between the Nige-

rian government and UNESCO, NICO was created during the World Decade for Cultural Development (1988–1997). Its functions include training cultural development officers, developing curricula and cultural materials, conducting public awareness campaigns, and promoting cultural research. Local language issues feature prominently in NICO's agenda: the institute recognises that language is a foundational aspect of identity, culture, and heritage, and is essential for social integration and national unity. The Nigerian Indigenous Language Programme (NILP), one of NICO's core initiatives, was launched in 2007 in response to concerns over the decline of indigenous languages. NILP is designed to raise awareness of the need to learn and use indigenous languages, foster pride and identity, and preserve those languages from extinction. The programme operates through various editions – such as one-month, weekend, and “barracks” editions – and is now implemented in NICO's Abuja headquarters and zonal/state offices across Nigeria.

To achieve its objectives, the Institute organizes an annual four-week intensive language training program every August simultaneously across the Institute's seven zonal and four state offices. A weekend version of the language training also runs throughout the year at the NICO Head Office in Abuja, and Lagos Office. Similarly, there is a Language in the Barracks version of the programme carried out in all the Institute's offices, where resource persons go into military and paramilitary barracks to teach Nigerian indigenous languages.

Much effort is already being made to promote the use of indigenous languages. This cuts across music, movies, advertising, the internet, and other media. In the music industry, many of our hip-hop artists now sing a mixture of Igbo/English, Yoruba/English, and Efik/English songs; Hausa/English is also included. This local flavour makes contemporary music appeal to both the young and the old in Nigeria. Section 14 (c)–(e) of the NLP (2022: 14) states that the Federal Government considers “all Nigerian languages are national treasures and heritage to be preserved from danger; all Nigerian languages are equal and none shall be held superior or inferior against the other; all Nigerian languages shall be assigned equitable functions and roles for communication and interaction within the socio-economic domains of the country”. In the light of the foregoing declaration, it is important that other languages are also promoted. Many print and electronic media advertisements have their

equivalents in at least three major languages. Few multinational companies do this for now. More multinational companies should be encouraged to emulate those already advertising their products in local languages. There could also be a policy by the advertising regulatory board stipulating that any billboard to be placed in any community must be translated into the immediate community's language. The internet can be a veritable source of promoting indigenous languages if adequate effort is put in. While efforts are already being put in place on minimal levels, such as the ability to Google in the three major languages, and a few indigenous platforms, like "Proudly Yoruba" and "Ábiyamo," much more can still be done in Nigeria on social media like WhatsApp, Facebook, etc., to promote not only the three major Nigerian languages (Hausa, Igbo, and Yoruba), but also several others recognised in national policy and scholarship. For example, the Federal Ministry of Education and the Nigerian Educational Research and Development Council (NERDC) identify nine indigenous languages – Efik, Fulfulde, Hausa, Igbo, Kanuri, Tiv, Yoruba, Edo, and Ibibio – as priority languages for development and use in education (Bamgbose 1991b; Igboanusi/Peter 2005). Including these languages reflects a broader commitment to linguistic diversity and acknowledges the need to preserve and revitalise a wider spectrum of Nigeria's linguistic heritage, beyond the dominance of the three major tongues.

Concerned about the low interest in mathematics and science subjects, the then Minister of Science and Technology, Dr. Ogbonnaya Onu, informed the public on January 30, 2017, that plans were underway to follow in the path of countries like India and China by ensuring that primary schools in the country teach mathematics and science subjects in native languages, to encourage the application of science and technology in the country (Chiedozie 2017). On May 31, 2017, Dr. Onu announced, during the institution of an inter-agency committee set up to strengthen the capacity of local languages as a medium for the teaching of mathematics and science subjects, that the teaching of science subjects and mathematics in local languages would begin shortly in primary and secondary schools across the nation. He observed that many pupils, especially in rural areas, speak their mother tongue at home while the language of instruction in school is a non-native language. Consequently, they are faced with the challenge of understanding the non-native lan-

guage before they can even begin comprehending the subject being taught. Prior to Dr. Onu's announcement, the Minister of Education, Adamu Adamu, stated that "using mother tongue to teach science and mathematics would certainly help and ensure better understanding of the subjects" (Premium Times 2017).

On 22<sup>nd</sup> of November 2022, the federal government announced the approval of a new National Language Policy, which makes mandatory the use of the language of the immediate environment as the language of teaching and learning in public primary schools. Although the policy is supposed to be in operation already, strict adherence to the policy can only take effect when the government generates relevant teaching aids and trains an adequate number of qualified language teachers. The minister further stressed that the government was prepared to treat all indigenous languages equally, to preserve the different cultures and their peculiar idiosyncrasies, because so much had already been lost due to the extinction of some local languages. Indeed, all languages are valuable and packed with loads of information that can benefit humankind (Egbokhare 2011).

According to Owolabi (2006), efforts made to translate and lexicalise local languages to enable them to function in different areas of Science, Technology, Engineering, and Mathematics (STEM), agriculture, law, politics, and linguistics include:

- i. A glossary of technical terminologies in science and mathematics for primary schools in Nigeria (GTTSPSN) in nine languages (Edo, Efik, Fulfulde, Hausa, Igbo, Ijo, Kanuri, Tiv and Yoruba), sponsored by the Federal Ministry of Education.
- ii. metalanguage in three languages on linguistics, literature and methodology, sponsored by National Educational and Research Development Council (NERDC)
- iii. 1999 Constitution of the Federal Republic of Nigeria translated into three languages (1st phase)
- iv. a quadrilingual glossary of legislative terms (QGLT) completed in three languages, sponsored by NERDC
- v. Yoruba Dictionary of Engineering physics (YDEP), produced by an engineer, Mr. Odetayo.

The glossary of technical terminologies in science and mathematics for primary schools in nine Nigerian languages, published in 1980 by the Federal Ministry of Education is believed to be the most exhaustive attempt so far at developing the register for the sciences in indigenous Nigerian languages.

In translating mathematics and science terminologies into the nine languages (chosen based on their being used for national broadcasts at the time), effort was first made to find an indigenous equivalent before resorting to borrowing. The names for objects which exemplify the concept represented by the English term were often found useful as local equivalents. For example, the term “cone” is translated as *ikoto* in Edo language. *Ikoto* in Edo language is a conical-shaped piece of carving that children use in playing a game of the same name. Since *ikoto* has a conical shape, the adaptation of the word to mean cone is a true objectivisation of the concept of cone which is expected to help children to understand the concept more easily (Federal Ministry of Education 1980: 12). Similarly, the Yoruba word for pie-graph is *girááfu eléèbu osàn* (Federal Ministry of Education 1980: 231). The pictorial representation of data in a circular manner in a pie graph is similar to the divisions on the surface of a sliced orange referred to as *eléèbu osàn*. It is believed that adapting the term *eléèbu osàn* to refer to a pie graph will aid pupils’ understanding of the concept. While this glossary has been applauded for being the most comprehensive guide to date for the use of Edo, Efik, Fulfulde, Hausa, Igbo, Ijo, Kanuri, Tiv and Yoruba as languages of instruction in primary schools, especially in the teaching of science and mathematics, it has been criticised for some shortcomings. Commenting on the Yoruba portion of the glossary, Eleshin (2022: 47) opines that some of the terms developed “are imprecise. As such, they do not aptly convey the notion expressed in existing English terms. Two, the terms are no longer in line with the present curriculum on basic science and technology as approved by the Federal Ministry of Education.” The document has also been criticised for its excessive use of the word-loaning strategy (even where there are suitable equivalents in the relevant indigenous languages) which should have been a last resort.

A good-faith effort has been made by the Nigerian government in promulgating the new National Language Policy (2022), and stating clearly in sections (27), (28), (38) and (39) that:

- Efforts shall be made to develop science and technology textual and other instructional materials in various languages;
- Registers of science and technology in the various Nigerian languages shall be developed and regularly updated to encourage the teaching and learning of STEM;
- Government at all levels shall make efforts to develop science and technology textual and other instructional materials in various Nigerian languages;
- Government at all levels shall make efforts to develop metalanguages in STEM in various Nigerian languages.

While this is laudable, the government must take this a stage further by ensuring a prompt implementation of these policies.

## **Recommendations**

The Nigerian government needs to develop a language policy that vigorously and effectively promotes Nigerian indigenous languages in all schools, and makes the learning of at least one indigenous language compulsory in all schools rather than optional, as it is currently. Parents should be enlightened on the advantages of speaking the indigenous language/mother tongue to their children as their first language. It is a known fact that the problem of using and promoting indigenous languages is more prominent in Southern Nigeria (see Raheem 2013; Olorunjoba-Oju 2022). Perhaps other tribes should begin to take a cue from the Northern ethnic groups in Nigeria. Typical Hausa parents speak Hausa, Fulani or Kanuri to their children from birth. The Hausa people are so passionate about their language, that a foreigner who can speak their language at whatever level of proficiency is immediately regarded as a friend. Nigerians can also borrow ideas from the Ainu of Japan who have a model of learning where the young ones are taught the language by elders in the community, similar to local ethnic groups in the Philippines that run Schools of Living Tradition in order to preserve their indigenous languages, customs, and tradition (Degawan 2019).

Similarly, schools should be advised to stop punishing students for speaking “vernacular” in school. Policy implementers should ensure the use of the mother tongue or the language of the immediate environ-

ment to teach pupils at the primary school and junior secondary school levels. Indigenous languages should also be taught at the General Studies level in higher institutions. The Lagos State University of Education (LASUED) has taken a significant step toward preserving the Yoruba language by incorporating it into its General Nigeria Studies (GNS) curriculum (Punch Nigeria 2023). Under a law signed by the Lagos State Government on 8 August 2018, Yoruba must be included in the GNS programme of all Lagos State tertiary institutions, and LASUED implemented this requirement as a compulsory course for 100- and 200-level students, with passing the subject now a prerequisite for graduation. Punch Nigeria (2023) reports that after LASUED became a university, its senate approved the teaching of Yoruba in GNS in 2022, and the course commenced in the 2022–2023 session. Other tertiary institutions in the country should be encouraged to follow suit.

According to Ajepe and Ademowo (2016), the teaching of indigenous languages in Nigeria should not be limited to theoretical instruction but should also include practical components. They emphasise that language assessment ought to cover both oral and written competence in order to ensure holistic proficiency. Furthermore, they recommend the adoption of regional lingua francas, with Hausa designated for the North, Yoruba for the West, and Igbo for the East, each assigned functional roles in key domains such as education, the judiciary, and the media. While acknowledging the continued importance of English, Ajepe and Ademowo (2016) argue that it should remain the national language but not the lingua franca. Instead, they propose that English be retained as a subject taught in schools, as the medium of instruction at the senior secondary level, and as the principal language for international communication. However, they stress that English should be accorded less significance in the daily lives of Nigerian citizens.

Mother tongue-based education (which includes the teaching of STEM in local languages) is not a feat that can be achieved overnight. The government must be determined and consistent not only in formulating the relevant policies, but also in ensuring the implementation of such policies. All stakeholders (Federal/State/Local Governments and their agencies, linguists, language and cultural associations, the media, tertiary institutions, parents, every Nigerian) must play their role in promoting indigenous Nigerian languages (see Emenanjo 1996; Owolabi

2006; Oloruntoba-Oju 2022; Yusuff 2022; Bamgbose 2023, etc. for the roles these stakeholders are expected to play). A change in attitude towards indigenous languages is particularly required from Nigerian parents. The Yoruba proverb “*Ilé la tí ní k’ẹ̀ṣòó ròde,*” which corresponds to the English proverb “Charity begins at home,” drives home the point. Parents should be enlightened on the importance of communicating with their children at home solely in their mother tongue and on the fact that speaking indigenous languages at home enhances rather than hinders a child’s ability to acquire the English language in school or elsewhere.

## Conclusion

This paper has dwelt on the issues, challenges, and prospects of using indigenous Nigerian Languages for communicating scientific knowledge. It explores the linguistic situation of Nigeria, examines issues and challenges in using indigenous languages to communicate scientific knowledge in Nigerian schools, and the efforts being made to increase the capacity of indigenous languages to serve as effective mediums of instruction in mathematics and science subjects. It is my considered opinion that a proper foundation should be laid out before indigenous languages become the medium of instruction for pupils in primary schools across the country, and the Federal Government should ensure that such innovation is sustainable and will not be subjected to the political caprices of successive governments. Nigeria is endowed with a vast number of native languages, with several of these languages having only a small number of speakers, which is bound to pose specific problems regarding the availability of educational materials, teachers, and even orthographies. Suppose we are to stem the tide of language death and promote mother tongue-based education, we must think of creative and innovative ways of encouraging collaboration and cooperation among federal/state/local governments, different organizations, communities, and individuals to record, describe, strengthen, and preserve all local languages (small or big). In many contexts, political, religious, economic, and other sociocultural pressures have influenced speakers of minority languages to accept, often with a degree of willingness, instruction in a dominant neighbouring language rather than in their mother

tongue. Here, *willingness* does not necessarily indicate free or enthusiastic choice; rather, it reflects a pragmatic acceptance of prevailing conditions, where individuals perceive potential social mobility, economic advantage, or wider communication as benefits of adopting the dominant language (Bamgbose 2011; Igboanusi 2017). A clear example of this situation is evident in parts of Northern Nigeria, where Hausa functions as the medium of instruction for children who are not native speakers of the language (Omoniyi 2018). Such linguistic accommodation demonstrates how power relations in multilingual societies shape language attitudes and educational practices, often subordinating minority languages in favour of those associated with broader influence and prestige. As succinctly expressed by Ngũgĩ wa Thiong’o in his book entitled *Decolonising the Mind: The Politics of Language in African Literature*, published in 1986, development in various fields of academics, science, and technology will continue to elude Africa and Africans until we can communicate our thoughts and world view in our indigenous languages. Wa Thiong’o believes that the creation of diverse literature in indigenous African languages by African writers will unlock the potential of African languages to accommodate concepts in the fields of philosophy, science, technology, and all other areas of human creative ventures.

## References

- Abimbola, W. 1976. *Ifa: An exposition of Ifa literary corpus*. Oxford University Press.
- Adebija, E. 1994. “The context of language planning in Africa: An illustration with Nigeria.” In *Language contact and language conflict*, ed. by M. Pütz, 149–175. John Benjamins Publishing Company. doi.org/10.1075/z.71.08ade.
- Ademowo, A. J. 2016. “Indigenous languages and the development question in Africa.” *International Journal of History and Cultural Studies* 2(1): 39–45. dx.doi.org/10.20431/2454-7654.0201004.
- Ajepe, I., and Ademowo, A. J. 2016. “English language dominance and the fate of indigenous languages in Nigeria.” *International Journal of History and Cultural Studies* 2(4): 10–17. dx.doi.org/10.20431/2454-7654.0204002.

- Atchoarena, D. 2023. *Offering education in the mother tongue is essential to transmitting and preserving traditional knowledge and culture* [Speech]. UNESCO Institute for Lifelong Learning. Retrieved from <https://www.uil.unesco.org/en/articles/international-mother-language-day-2023>.
- Badejo, R. B. 1989. "Multilingualism in sub-Saharan Africa." *Media Review* 3(2): 40–53.
- Bamgbose, A. (ed.). 1976. *Mother tongue education: The West African experience*. Hodder & Stoughton; UNESCO Press. <https://eric.ed.gov/?id=ED129097>.
- Bamgbose, A. 1989. "Issues for a model of language planning." *Language Problems and Language Planning* 13(1): 24–34. doi.org/10.1075/lplp.13.1.03bam.
- Bamgbose, A. 1991a. *Speaking in tongues: Implications of multilingualism for language policy in Nigeria*. Nigeria National Merit Award Winner's Lecture.
- Bamgbose, A. 1991b. *Language and the nation: The language question in sub-Saharan Africa*. Edinburgh University Press.
- Bamgbose, A. 2011. *Language and exclusion: The consequences of language policies in Africa*. LIT.
- Bamgbose, G. 2023. "Nigeria at 63: An appraisal of the language situation." *Business Day*. <https://businessday.ng/columnist/article/nigeria-at-63-an-appraisal-of-the-language-situation/>.
- Brann, C. M. B. 1980. *Mother tongue, other tongue and further tongue*. Inaugural Lecture, University of Maiduguri.
- Chiedozie, I. 2017. "Schools to teach maths, science in indigenous languages." *Punch*. <https://punchng.com/schools-teach-maths-science-indigenous-languages-onu/>.
- Dakin, J., Tiffin, B., and Widdowson, H. G. 1968. *Language in education: The problem in Commonwealth Africa and the Indo-Pakistan sub-continent*. Oxford University Press.
- Degawan, M. 2019. "Indigenous languages: Knowledge and hope." *The UNESCO Courier*. <https://en.unesco.org/courier/2019-1/indigenous-languages-knowledge-and-hope>.

- Egbokhare, F. O. 2011. *The sound of meaning*. Inaugural Lecture delivered at the University of Ibadan, Nigeria, on Thursday, 14 July, 2011.
- Eleshin, A. 2022. "A critique of the Yorùbá section in 'Vocabulary of primary science and mathematics in nine Nigerian languages.'" *Ihafa: A Journal of African Studies* 13(1): 46–60. <https://ihafa.unilag.edu.ng/article/view/1499>.
- Emenanjo, E. N. 1985. "Nigerian language policy: Perspective and prospective." *Journal of the Linguistic Association of Nigeria* 3: 123–134.
- Emenanjo, E. N. 1996. "Languages and the national policy on education: Implications and prospects." *Fafunwa Foundation Internet Journal of Education*. Retrieved from <http://fafunwafoundation.tripod.com/fafunwafoundation/id9.html> fafunwafoundation.tripod.com.
- Fafunwa, B. 1983. "Yorùbá in education." In *Yorùbá language and literature*, ed. by A. Afolayan, 271–284. Ibadan University Press.
- Fafunwa, A. B., Macauley, J. I., and Sokoya, J. A. F. (eds.) 1989. *Education in mother tongue: The Ife primary education research project (1970–1978)*. University Press Limited. Retrieved from <https://files.eric.ed.gov/fulltext/ED350120.pdf> files.eric.ed.gov.
- Federal Ministry of Education. 1980. *A glossary of technical terminology for primary schools in Nigeria*. Nigerian Educational Research and Development Council.
- Francis, O. A., and Olojo-Kosoko, K. K. 2024. "Ifá Divination System: An Artistic Expression of Yoruba Knowledge Creation." *Current Journal of Humanities, Arts and Social Sciences* 11(6): 87–101.
- Gbenedio, B. U. 2010. "Problems of implementing the Nigerian national language policy: The case of instruction through the mother tongue at the lower primary classes." *Ekiadolor Journal of Education* 13(2): 47–58.
- Igboanusi, H., and Peter, L. 2005. *Languages in competition: The struggle for supremacy among Nigeria's major languages, English and Pidgin*. Peter Lang.
- Igboanusi, H. 2017. "Language policy in multilingual Nigeria: Challenges, prospects, and implications." *Journal of West African Languages* 44(1): 37–52.

- Iwara, A. U. 1981. "Mother-tongue education: Problems and prospects in a post-colonial African state." *Présence Africaine* 119: 90–108. <https://www.jstor.org/stable/24350660>.
- Iwara, A. U. 2008. "The linguistic situation in Nigeria and its implication for sustainable development." *Inaugural lecture*, University of Ibadan Press.
- Kioko, A. 2015. "Why schools should teach young learners in home language." *British Council*. Retrieved from <https://www.britishcouncil.org/voices-magazine/why-schools-should-teach-young-learners-home-language>.
- MacDonald, N. I. 2023. "Why Inuit culture and language matter: decolonizing English second language learning." *AlterNative: An International Journal of Indigenous Peoples* 19(4): 794-803. [doi.org/10.1177/11771801231197841](https://doi.org/10.1177/11771801231197841).
- Musa, R. J. 2010. "The role of mother tongue education in national development." In *Social Studies and integrated national development in Nigeria*, ed. by E. Osakwe, 75–82. Kraft Books.
- National Language Policy. 2022. Lagos: NERDC Press. [https://nerdc.gov.ng/content\\_manager/pdf\\_files/national\\_language\\_policy.pdf](https://nerdc.gov.ng/content_manager/pdf_files/national_language_policy.pdf).
- Olaoye, A. A. 2002. "Sociolinguistics of communication skills." In *Linguistics and literature for language arts*, 15–30. Rainbow Royale Publishers.
- Olatunde-Ojo, G., Enighe, J., and Ogidi, O. C. 2022. "Linguistic diversity in Nigeria: Implications for teaching English as a second language." *Sapientia Foundation Journal of Education, Sciences and Gender Studies* 4(4): 43–52. <https://sfjesgs.com/index.php/SFJESGS/article/view/345/349>.
- Oloruntoba-Oju, T. 2022. "Nigerian 'duelling' languages and the backlash phenomenon: Prognosis for the resurgence of indigenous languages." In *Language and development in Africa: Prospects for decolonisation and empowerment*, ed. by T. Oloruntoba-Oju, B. van Pinxteren, and J. Schmied, 101–124. Cuvillier. [https://cuvillier.de/get/ebook/6559/9783736966215\\_eBook.pdf](https://cuvillier.de/get/ebook/6559/9783736966215_eBook.pdf).
- Omoniyi, T. 2018. *The sociology of language and religion: Change, conflict and accommodation*. Routledge.

- Orji, D. M. A., and Udeze, N. S. 2021. "The use of indigenous languages in tertiary education in Nigeria." *Nigerian Journal of African Studies* 3(1): 117–129. <https://www.nigerianjournalsonline.com/index.php/NJAS/issue/view/NJAS?utm>.
- Owolabi, K. 2006. "Nigeria's native language modernization in specialized domains for national development: A linguistic approach." *Inaugural Lecture*, University of Ibadan, Nigeria.
- Oyinloye, C. A. 2010. "Two variants of audio-lingual methods as determinants of junior secondary school students' learning outcomes in oral English." Unpublished doctoral dissertation. University of Ibadan, Nigeria.
- Prah, K. K. 1995. *Mother tongue for scientific and technological development in Africa*. German Foundation for International Development Education, Science and Documentation Centre.
- Premium Times. 2017. *Nigeria begins moves to teach maths, science in mother tongue*. Premium Times. <https://www.premiumtimesng.com>
- Punch Agency Report. 2023. *LASUED incorporates Yoruba language into general Nigeria studies*. Punch. <https://punchng.com/lasued-incorporates-yoruba-language-into-general-nigeria-studies/>.
- Raheem, S. O. 2013. "Sociolinguistic dimension to globalisation: Gradual shift in Yoruba personal names among youths in Southwestern Nigeria." *The African Symposium: An Online Journal of the African Educational Research Network* 13(1): 88-93. Retrieved from <https://api.semanticscholar.org/CorpusID:130705249>.
- Sibayan, B. P. 1968. "Pilipino as language of instruction in Philippine schools, colleges and universities." *Philippine Journal of Education* 45: 18–22.
- Skutnabb-Kangas, T. 2000. *Linguistic genocide in education or worldwide diversity and human rights?* Routledge. [doi.org/10.4324/9781410605191](https://doi.org/10.4324/9781410605191).
- Sudoh, R., and Darr, B. 2022. "In Asia-Pacific, indigenous languages help safeguard knowledge and culture." *Global Partnership for Education*. <https://www.globalpartnership.org/blog/asia-pacific-indigenous-languages-help-safeguard-knowledge-and-culture>.

- Tsaure, M. B., and Sani, A.-U. 2024. "Indigenous languages as medium of instruction in Nigerian primary schools: Significance and implications." *Tasambo Journal of Language, Literature, and Culture* 3(1): 32–39. doi.org/10.36349/tjllc.2024.v03i01.004.
- Tulloch, S., Pilakapsi, Q., Shouldice, M., Crockatt, K., Chenier, C., and Onalik, J. 2009. "Inuit perspectives on sustaining bilingualism in Nunavut." *Études/Inuit/Studies* 33(1–2): 133.
- Udosen, A. E. 2002. "Towards the enhancement of literacy in the Ibibio language at the primary school level." *Literacy and Reading in Nigeria* 9(2): 283–290.
- Udosen, A. E. 2013. "Language and communication in a multilingual Nigeria: Implication for UBE English language curriculum development." *Asian Journal of Educational Research* 1(1): 1–10. <https://www.multidisciplinaryjournals.com/wp-content/uploads/2013/10/LANGUAGE-AND-COMMUNICATION-IN-A-MULTILINGUAL-NIGERIA-IMPLICATION>.
- Van Pinxteren, B. 2022. "Language of instruction in education in Africa: How new questions help generate new answers." *International Journal of Educational Development* 88: 102524. doi.org/10.1016/j.ijedudev.2021.102524.
- Wa Mberia, K. 2015. "The place of indigenous languages in African development." *International Journal of Language and Linguistics* 2(5): 52–60. [https://www.ijllnet.com/journals/Vol\\_2\\_No\\_5\\_November\\_2015/5.pdf](https://www.ijllnet.com/journals/Vol_2_No_5_November_2015/5.pdf).
- Wa Thiong'o, Ngũgĩ. 1986. *Decolonising the mind: The politics of language in African literature*. Heinemann.
- Yusuf, K. 2017. "Nigeria begins moves to teach maths, science subjects in indigenous languages." *Premium Times*. <https://www.premium-timesng.com/news/232659-nigeria-begins-moves-to-teach-maths-science-subjects-in-indigenous-languages.html?tztc=1>.
- Yusuff, L. A. 2022. "Language engineering and the dynamics of reconfiguring African studies." *Inaugural Lecture*, University of Lagos Press, Nigeria.