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Language of instruction policy in Nigeria: Assessing implementation and literacy achievement in a multilingual environment

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ABSTRACT

In this study, I evaluate adherence to Nigeria's Language of Instruction (LOI) policy, which mandates that primary school students be taught in indigenous language. Using multivariate regression analysis and data from round 6 of the Multiple Indicator Cluster Survey (MICS6), I assessed disparities in adherence between school types (public and private schools) and location (urban/rural areas) and regions. The results reveal private schools exhibit lower implementation rates than public schools, while urban areas lag behind rural areas, and the southern region trails the north. This highlights the challenges of enforcing a uniform LOI policy in Nigeria's linguistically diverse setting. I also examine the relationship between LOI and literacy outcomes using regression and propensity score matching anaysis. Contrary to prevailing notion that teaching children in an indigenous language improves learning outcomes, my findings show that students taught in English outperformed their peers taught in indigenous languages. This departure from the norm underscores the need to reassess generalized conclusions derived from less lingustically diverse contexts, as they might not apply settings like Nigeria. It also calls for a nuanced understanding of how LOI influences learning outcomes in diverse contexts, emphasizing the importance of tailoring educational policies to local realities.

1. Introduction

In multilingual countries, such as Nigeria, the language of instruction (LOI) in the early years of schooling has been a significant area of focus in education policy. In Nigeria, interest in this policy area is spurred by two interconnected factors. First, despite achieving near-universal primary attendance, Nigeria still grapples with a learning crisis, as evidenced by significantly low learning outcomes. According to Adeniran et al. (2020), on average, only 17 per cent of students meet the literacy competency standards in Nigeria, while only 31 per cent meet the numeracy competency standards. Second, globally, there is some evidence that claims that children learn more easily in their mother tongue (L1), and the skills they acquire while learning in their mother tongue can be transferred to learning in a second language (L2) (Cummins, 1979). Most research now concludes that children who start learning in their mother tongue tend to perform better academically, even upon transitioning to another language later (Hungi and Thuku, 2010) and Thuku.

Since 1977, the Nigerian official LOI policy has stipulated that children should be taught in their mother tongue or the 'language of the immediate community' in the foundational stages of primary school (Primary 1–3). However, due to various political and logistical factors, anecdotal evidence suggests that this policy has seldom been implemented. For example, in many urban centres, where classrooms are often multilingual, teachers often use English as the instructional language to accommodate the diverse linguistic backgrounds of the students. Additionally, in rural areas, there have been reports of schools continuing to use English as the instructional language due to a lack of qualified teachers proficient in local languages. In November 2022, the government reinforced this policy, extending it to all six primary school years and mandating using indigenous languages as the instructional language in all primary schools. While announcing the policy, the Minister of Education emphasized that the policy is grounded in "research that has shown pupils learn much better when instruction is in their mother tongue at the primary school level" (Adamu, 2022).

Despite the longstanding language policy and supportive evidence, there has been a discrepancy between the LOI policy and its practical implementation in Nigeria, as in many sub-Saharan African (SSA) countries (Ogunbiyi, 2008; Trudell, 2018). Nigeria is one of the most linguistically diverse countries in the world, with over 500 spoken languages and English as the official language (Bamgbose, 2005). The range of languages spoken among different ethnic groups in Nigeria

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complicates the implementation of the LOI policy. Amongst other factors, implementing the LOI policy is difficult because it requires reading materials that are available in all languages and teachers who are conversant and available to teach in all languages (Trudell, 2018). Additionally, the LOI is ambiguous and does not sufficiently clarify how the 'mother tongue' or 'language of the immediate environment' can be interpreted, especially in such a multilingual country as Nigeria. Therefore, in communities where several languages are spoken, there might be disagreement about which language should be regarded as the language of the immediate environment.

Furthermore, the plurality of languages also raises questions about the generalizability of the consensus favouring mother-tongue instruction. Most existing evidence comes from high-income countries and is focused on bilingual education with two linguistically similar languages (e.g., English and Spanish). Even where research has been conducted in similarly multilingual SSA countries, the findings are limited by the extent of linguistic diversity because the research has been focused on language-homogenous areas (for example, see (Piper et al., 2016) randomized control trial in Kenya).

My paper has two primary objectives. First, it seeks to assess the level of LOI policy implementation in primary schools in Nigeria, comparing differences between public and private schools. While the LOI policy is mandatory for public and private schools, previous studies suggest varying levels of implementation, with private schools often favouring English as the LOI, while public schools tend to use indigenous languages in the early years, as prescribed (Harma, 2013; Kolawole and Dele, 2002). I answer the following research questions:

- 1a) Does policy implementation of Nigeria's language of instructional policy differ between public and private primary schools during the first three years?
- 1b) What factors affect the implementation of the LOI policy?

Second, as noted, there is a well-established consensus based on research carried out in bilingual and high-income countries such as the United States and Canada (see and Cummins, 2000) that teaching children in their mother tongue will advance their learning. There is now also evidence from multilingual contexts and lower-middle-income countries (LMICs), such as Ethiopia and Kenya, supporting the benefits of mother tongue instruction (see Piper et al., 2016 for Kenya and Seid, 2016 for Ethiopia). However, much of the evidence is still derived from linguistically homogenous settings within these countries, which may not fully capture the complexities of highly multilingual contexts. Given Nigeria's multilingual and complex language landscape, I assess if the original evidence base on mother tongue instruction and student learning is context-specific to linguistically homogenous settings. Specifically, I assess if Nigeria's complex multilingual landscape overturns conventional wisdom around LOI and student learning outcomes. To address this, I ause regression and propensity score matching to answer the following research questions:

- 2a) Are there any associations between the language of instruction in class and student learning outcomes for primary 1–3 students?
- 2b) Are there any associations between learning specifically in one's mother tongue and student learning outcomes for students?

Using data from the 2020/2021 Multiple Indicator Cluster Survey, round 6 (MICS6) (NBS-UNICEF, 2022), my study is among the first to use nationally representative data in SSA to assess and compare the LOI policy implementation level between school types. This dataset is the first round of the MICS to include a foundational numeracy and literacy component for Nigeria. To my knowledge, my study is the first to assess associations between LOI and literacy performance using MICS in Nigeria.

My findings indicate that generally, the implementation of the LOI policy is low in primary schools. It further reveals disparities in the implementation of previous LOI policies across various demographics. Private schools exhibit lower implementation rates than public schools, while urban areas lag rural areas, and the southern region trails north. In terms of learning, contrary to the prevailing notion that teaching children in an indigenous language improves academic performance, my findings suggest otherwise. Students taught in English outperformed their peers taught in indigenous languages, seemingly challenging the conventional knowledge that teaching a student in their native language improves their learning outcomes.

The remainder of this paper is organized as follows. In Section 2, I provide context on languages in Nigeria and discuss Nigeria's LOI policy. In Section 3, I review prior research on implementing mother tongue policies and the relationship between instructional language and learning outcomes in primary schools. In Section 4, I describe the data and empirical approach. Section 5 presents the results. The final section contains further discussions and conclusions.

2. Language landscape in Nigeria and the language of instruction policy

This section provides an overview of the language landscape and the language of instruction policy set out in the Nigerian Policy on Education (NPE).

2.1. Language in Nigeria

Different researchers put the number of languages spoken in Nigeria between 150 and the most recent estimates at 521 (Bamgbose, 2005; Okebukola, 2012). This linguistic diversity has raised issues of national unity and cultural integration in the nation. Therefore, to promote unity, English has been used as the official language in all spheres of the country, including the education sector, since independence in 1960 (Bamgbose, 1971). Besides English, there are three major Nigerian languages - Igbo, Hausa, and Yoruba (Federal Republic of Nigeria, 1977). Out of a population of about 200 million, Igbo is predominantly spoken in the southeast and is spoken by around 27 million people, Yoruba is predominantly spoken in the southwest by approximately 40 million people, and Hausa is predominantly spoken in the north by around 60 million people (Statista, 2024). To promote a political ideology of national unity, each Nigerian is encouraged to learn English and one of the three major languages (in addition to their mother tongue – if different).

Proper implementation of the mother tongue policy would require identifying and adopting the over 500 languages in primary education in Nigeria (Trudell, 2018). However, of all the indigenous languages, only the three major languages plus English have been documented as languages used for classroom instruction. There is a greater diversity of languages spoken in urban areas as cities have more exposure to people from different regions and ethnicities. As a result, urban areas are more likely to have multilingual populations, with people speaking various languages depending on the region. Therefore, the mother tongue is highly diverse in urban areas, reflecting the heterogeneity of ethnicities and tribal groups that make up a community. In rural areas, on the other hand, the population is more homogenous, and there is less exposure to people from different regions and ethnicities. As a result, rural areas are more likely to be linguistically homogeneous (in terms of indigenous languages), with most of the population in a community speaking the same language, including English (or Pidgin - a simplified form of English, often using words from various Nigerian language and adapted to suit local contexts). This difference between rural and urban areas suggests that it might be easier to interpret and implement the 'language of home environment' in rural areas than in urban areas (FRN, 2013).

The language plurality in Nigeria implies that ensuring that most students learn in their mother tongue is extremely challenging, especially in more ethnically diverse and heterogeneous areas.

2.2. Language of instruction policy in Nigeria and issues with interpretation

Despite the range of languages spoken amongst the different ethnic groups, Nigeria does not have a distinct language policy document for the education sector. However, it has a language policy included in the National Policy on Education (NPE), which serves as a guiding framework for developing and implementing education in the country and covers various aspects such as curriculum, funding, educational objectives, and access to education (Federal Republic of Nigeria (FRN), 2013). While the NPE is not a standalone law, it provides the foundation upon which laws, regulations and administrative actions related to education are based, and compliance with its provisions is typically mandatory for stakeholders in the education sector (including public and private schools). Therefore, it is legally binding to guide educational practices and policies in Nigeria.

The most recent version of this policy, from 2013 (the focus of this paper), states that "the medium of instruction in [all] primary schools shall be the language of the immediate environment for the first three years in monolingual communities…[and] from the fourth year, English shall progressively be used as a medium of instruction" (FRN, 2013: 8). The NPE states that this LOI policy, amongst the other policies, is designed in pursuance of the objectives of primary school education in Nigeria, two of which are to inculcate permanent literacy and numeracy (FRN, 2013:7) and to provide children with diverse basic knowledge and skills to support educational advancement and wealth generation (FRN, 2013:4).

Implementing the language policy in the NPE has been complex and difficult for several reasons. The language policy limits the LOI policy to only 'monolingual communities' (that is, linguistically homogenous), which raises uncertainties around what that means practically. The concept of a monolingual community is not always clear-cut, and defining such a community in a real-world context in Nigeria is difficult, given the dynamic linguistic landscape where monolingualism is rare, and individuals often navigate multiple languages in their daily lives. Monolingualism is further made rare by factors such as migration and urbanization and the effects of language contact and mixing, where people may use elements from several languages in their speech. Further complexities arise in defining such communities for Nigeria and implementing the language policies based on the different statuses the languages hold (as noted in Table 1 above) and the fact that only 27 first-tier indigenous languages are recognized by the government (Albaugh, 2014).

Another reason for the complexity in implementing the LOI policy is that the NPE does not provide clear guidance for how the "language of immediate environment" or 'mother tongue' should be defined in non-monolingual communities. In monolingual communities, the mother tongue may coincide with the language of the immediate environment. However, this may not be the case in multilingual communities. For example, in cities or large urban areas that receive a lot of migrants, there might be several mother tongues spoken. Therefore, a child's mother tongue could differ from the language of the immediate community. The NPE does not specify how the LOI policy should be interpreted in such multilingual communities. As a result, the implementation of the LOI policy faces significant challenges due to the ambiguity surrounding the language and the lack of guidance on how to interpret it.

The precise definition of mother tongue has been a subject of extensive discussion. In this paper, I adopt a simple definition from the United Nations Educational, Scientific and Cultural Organizations (UNESCO) Institute for Statistics, which aligns with the NPE's wording – a language learned in childhood in the home environment (UNESC0 Institute for Statistics, 2023). This definition is also aligned with those provided by researchers who have written about the LOI in Nigeria, such as Abijo (2014):124), who defines mother tongue education as "the use of the [indigenous] language or the first language to teach at formal and non-formal levels.'' On the other hand, the language of the immediate environment is less easily defined. However, some scholars in Nigeria have interpreted it to mean the same as 'mother tongue.' For example, in referring to teaching a child in their mother tongue, Fafunwa (1974) defines mother tongue education as teaching a child in "the first language learned in the home…the language of the child's immediate environment…the language in which [the child] thinks and feels" (Fafunwa, 1974: 123). Ochoma (2015):3 notes that the language of the immediate environment ''is, by implication, the mother tongue or the language spoken by the immediate community." Therefore, in this study, I use 'mother tongue' and 'language of immediate' environment interchangeably to mean a child learning in their L1.

This definition, coupled with the diversity of spoken languages, suggests that even if the LOI policy is properly implemented, many children may not learn in their mother tongue or L1. While some children will learn in their L1, others will learn in an L2, another indigenous language they may be familiar with but is not their mother tongue.

Table 1
Hierarchy of languages in Nigeria.

Hierarchical order	Language	Status
Official Language	English	The 'big four' national languages, official recognised at the federal.level.
Major languages[a]	Hausa, Igbo, Yoruba	
First tier Indigenous languages (minority language)	For example, Fulfide, Kanuri, Ibibio, Tiv, Edo, Efik, Ijaw, Etsako.[b]	Predominantly utilized within their respective state of origin and, although not extensively employed beyond regional boundaries, hold official recognition at the national or federal level.
Second tier indigenous languages (minority language)	For example, Urhobo, Nupe, Idoma[c]	Minor languages that are regionally important.
Third tier indigenous languages[d]	For example, Gwari, Boki, Katab, Angas	Important languages at the provincial level but with no official recognition at the state level.
Vernacular	Pidgin English	Unofficial informal language. Spoken in different variations nationally.

Source: National Policy on Education (1977;1981; 1998; 2004); Ufomata (1999). Note: The column headings and text in the status column are the author's own.

[a] Beyond being one of the four officially recognized languages, these languages are classified as major as they are spoken by a relatively larger number of people than other languages, even though speakers of the first/second/third tier languages, when combined, constitute the majority of the population of Nigeria (Essien, 1990).

[b] This is a small number of the local languages spoken in Nigeria. Each language listed above is spoken by at least 3 million people.

[c] These are some examples.

[d] This group encompasses more than 80% of Nigeria's over 500 languages, each with fewer than 300,000 indigenous speakers (Ufomata, 1999).

2.3. Amplifying the use of indigenous languages in primary schools

In November 2022, the government announced a new National Language Policy that makes the mother tongue the compulsory LOI through all six primary school years. While an official document enshrining this policy and documenting the details of this policy has not been released yet, the Minister of Education, Adamu Adamu, formally announced its approval by the Federal Executive Council—the highest decision-making body at the federal level in Nigeria—at a press conference on November 30th, 2022. He announced that the policy was mandatory and in effect from that day.

This policy contradicts the language regulation in the 2013 NPE and other previous iterations. This policy decision was made with limited

information regarding the current implementation status and a scarcity of evidence on whether the available evidence supporting mother tongue instruction and its impact on learning outcomes extends to Nigeria's multilingual landscape. Despite the longstanding provision dating back to the 1977 NPE that advocates for mother tongue instruction, there remains a dearth of robust evidence to evaluate potential gaps in past language regulations and their implementation. To bridge this crucial knowledge gap, my study endeavours to compare implementation levels between public and private schools across Nigeria's rural and urban areas. This will provide valuable insights into potential disparities between school types, shed light on the potential challenges associated with implementing the new National Language Policy, and establish a baseline for comparing the effectiveness of the new policy in the future.

3. Research

This section presents the existing literature on the implementation of the LOI policy in Nigeria (Section 3.1) and the available evidence on the effect of mother tongue instruction on student learning outcomes in similarly multilingual SSA countries (Section 3.2).

3.1. Prior evidence on the implementation of the Language of Instruction policy in Nigeria

In practice, there is limited adherence to the requirement of the language policy in the NPE. According to Ogunbiyi (2008), despite the government's policy, the LOI regulations have rarely been implemented as designed in Nigeria, especially in private schools. Most schools still teach in English, relegating indigenous languages to the background. Only a few studies (discussed below) have assessed the extent of implementation of the language policy in the NPE. However, these studies are not representative of what is happening across the country, with most of them usually focusing on the implementation in one linguistic group or a few communities.

In their survey of 100 basic education teachers in Gusau, Zamfara State (in the north of Nigeria), Ibrahim and Gwandu (2016) found that only 26 percent of teachers were aware of the language policy, and only 7 percent of teachers were implementing the language provisions of the NPE. In another survey of 71 teachers from 27 schools across three States in Nigeria – Oyo, Osun, and Ekiti (in the Southwest region), Abijo (2014) found that 95 percent of the sampled schools did not implement the language policy set out in the NPE. The sampled schools included 18 public schools and 8 private schools, and the study found no significant difference in the use of mother language as an instructional language between public and private schools. However, other studies, such as Deji Afuye et al.'s (2014 study in Ekiti, find a significant difference between public and private schools in using English as an instructional language, with private schools making more use of English. The preference for English as an instructional language in private schools aligns with parental attitudes, as studies such as Härmä (2013) have shown that parents with children in private schools prefer English as the instructional language, especially in cities.

Okebukola et al. (2013) conducted a study in Lagos state, with 36 science teachers in 12 primary schools in rural and urban areas. The study found a mismatch between the language policy and classroom practice, especially in urban areas. On average, science lessons in primary one, two, and three were delivered in the mother tongue languages in approximately 94 percent, 91 percent, and 85 percent of the sample, respectively, for rural schools. However, in urban schools, mother tongue instruction was reduced to about 62 percent, 49 percent, and 27 percent in primary one, two, and three, respectively.

Beyond the complications around the ambiguity and lack of clarity of the language of the LOI policy (described in Section 2.2), the perspectives and dedication of stakeholders to mother tongue education are essential for the success of programs. In Nigeria, such language policies are often met with resistance from both parents and educators, as is the case in other parts of SSA (for example, Trudell 2018 focused on Nigeria, Trudell and Piper 2014, and Khejeri 2014 on Kenya). Anyadiegewu (2016) claims that there have been situations where parents have pulled their children out of school solely because English was not used as the medium of instruction.

In the Ibrahim and Gwandu (2016) study focusing on Zamfara State, over 90 percent of the teachers reported that they did not think it was necessary to implement the language policy in the NPE. Additionally, 70 percent of the teachers reported that students preferred to be taught in English than in any other indigenous language, and 91 percent reported that students felt that learning in a mother tongue would not prepare them for international exams. Despite this preference, the teachers also reported that the students demonstrated more passion for learning and comprehended better when learning in an indigenous language.

Other logistical issues and resource constraints, such as the availability of teaching materials and qualified teachers, make it difficult to implement mother-tongue instruction. Ibrahim and Gwandu (2016) found that only 14 percent of surveyed teachers had relevant materials for teaching in the mother tongue. Trudell (2018) reports that most textbooks used in Primary one and beyond are written in English (except for Nigerian language subjects), which means that teachers must use those textbooks regardless of the language they teach in. Trudell (2018) reports that code-switching (switching from one language to another in the classroom) is prevalent in primary schools in Nigeria, especially in rural areas, which are constrained by the fact that teaching materials are available mostly in English.

Since the existing studies tend to concentrate on individual states or a few states within the same region, it is imperative to gain insights into the variations in implementation levels from a national perspective. Furthermore, it is important to rigorously examine potential disparities in implementation levels between public and private schools. This investigation is particularly crucial as private schools frequently possess a higher degree of autonomy in policy execution than public institutions, owing to their financial independence from governmental funding. This financial autonomy gives private schools greater control over their resources and decision-making processes, enabling them to implement policies and make operational decisions without being subject to the same level of government oversight and regulations as public schools. Further, the competitive nature of the private education market also motivates private schools to be adaptable and responsive to the demands of parents and students, which is relevant in this landscape where parents prefer for their children to be taught in English (Anyadiegwu, 2016).

Given this context, at the national level, I expect private schools will have lower implementation levels than public schools. However, it is essential to acknowledge potential heterogeneity across different regions and between rural and urban areas, which could temper this expectation. The dynamics of the private education market might vary significantly between urban and rural areas, which could impact how schools implement the LOI policy. Therefore, while national-level comparisons are insightful, disaggregating the data to examine regional and urban-rural differentials will provide a more nuanced understanding of the disparities in implementation levels between public and private schools. Strengthening this aspect in the literature elucidates the nuanced dynamics in educational policy implementation across diverse institutional settings.

3.2. Effect of mother tongue instruction on learning outcomes

There is a well-established academic consensus, based on research carried out in in bilingual and high-income countries such as the United States and Canada (see Cummins, 2000), that teaching children in the language they are brought up in, their mother tongue, or L1, is the most efficient way to advance their learning. The pedagogical benefits of a mother tongue-based approach to classroom instruction have been

extensively documented, especially in high-income countries. Cummins (2000) suggests that children taught to read in their mother tongue can read in a second language faster than those taught in a second language. Brock-Utne (2007) further suggests that students taught first in their mother tongue learn and perform better in English after switching to English in later years. The proponents of the mother tongue assert that the mother tongue can act as a bridge for transferring knowledge to a second language, as students can build on the knowledge they already have to develop advanced concepts.

There is also ample empirical evidence that mother tongue instruction positively affects learning and learning outcomes. However, most of the evidence is predominantly found within 1) higher-income countries, especially the United States and Canada (see Rossell and Baker 1996, Lopez and Tashakkori 2006, Cárdenas-Hagan et al. 2007), and 2) the field of bilingual education (which involves teaching children academic content in two languages). Such evidence has limited applicability for lower-middle income countries, especially post-colonial countries such as those in SSA, that are multilingual/linguistically diverse. For example, evidence on bilingual education is often focused on language pairs with some degree of linguistic similarity to English, such as English and Spanish or English and French (Cañado, 2005; Rivera, 2019; Taylor, 1976). Though not directly similar, transitioning between these languages might be facilitated because students often have some linguistic overlap that can aid the process. However, transitioning between English and African languages with fewer similarities, such as English and Igbo, may present more significant challenges for education programs that focus on transitioning from indigenous languages to English.

The evidence from SSA focusing on multilingual contexts is limited but growing (for example, see Brock-Utne's, 2010 study focusing on Tanzania and (Carter et al., 2020) study focusing on Ghana). Brock-Utne (2007) conducted an observational study of teachers over four weeks in Tanzania. He found that when teachers used English as a medium of instruction instead of Kiswahili, it slowed down the learning process considerably - only about half of the learning material was covered in a lesson taught in English, as was covered in a lesson taught in a familiar language. However, this study focused on comparisons between English and Kiswahili (a language spoken by most of the population in Kenya). Therefore, it offers little insight into contexts where most of the population are mother-tongue speakers of minority languages trying to acquire a second majority language.

Piper et al. (2016) conducted a randomised control trial to assess the impact of mother tongue instruction in Kenya, using data from the Primary Math and Reading (PRIMR) Initiative. The study focused on students in Primary 1 and 2 and assessed literacy skills in 5 domains – letter sound fluency, syllable fluency, nonword fluency, oral reading fluency, and reading comprehension. They studied the effect with two treatment groups – one group that was taught in English and Kiswahili (the two official languages of Kenya), and another group where students were taught in English, Kiswahili, and their mother tongue (either Kikamba or Lubukusu). The control group received no intervention (they were taught only in English). The intervention involved providing reading material for teachers and students in the respective languages (English and Kiswahili for treatment group 1, and the same plus either of the mother tongue languages for those in treatment group 2). Teachers in both groups attended a 10-day training (12 days for those teachers in the mother tongue group) focused on the research behind PRIMR's instructional approach and received instructional coaching.

Piper et al. (2016) found that the mother tongue program resulted in statistically significant improvement over the control group in letter sound fluency and reading comprehension, with effect sizes ranging from 0.37 SD to 0.56 SD, indicating that the implementation of the mother tongue program had a moderate impact on student outcomes. For comparison of students in the non-mother tongue and mother tongue programs, they found that students in the mother tongue program performed better on mother tongue oral reading fluency and reading comprehension.

Piper et al. (2016) research has implications for my study. However, its application to multilingual contexts remains uncertain due to inherent limitations in the Kenyan context and study sample. Specifically, though multilingual, Kenya's linguistic landscape differs markedly from Nigeria's. While Kenya has one official indigenous language that everyone speaks, Nigeria has three official languages, which, even when combined, are not spoken by the entire population. Additionally, the study was conducted in two relatively homogeneous language areas in Kenya, where there was less language diversity than in other parts of Kenya, potentially limiting the generalizability of findings to more linguistically diverse regions where there is no clear mother tongue to use.

The extent of multilingualism in Nigeria poses additional challenges. In many areas, there may be no clear mother tongue for instruction, making it difficult to determine the most appropriate instructional language. For example, while many children may receive instruction in an indigenous language, it may not be in their mother tongue, which can influence the dynamics of language acquisition and education outcomes. Given Nigeria's multilingualism, it is essential to question whether the conventional wisdom around mother tongue and LOI holds true in this context. As such, while existing research has elucidated the importance and impact of mother tongue instructions on learning outcomes, my study seeks to build on this literature and address this gap by leveraging nationally representative data from Nigeria to examine associations between LOI and student literacy outcomes.

4. Data and empirical methods

4.1. Data

I use data from the Multiple Indicator Cluster Survey, round 6 (MICS6) conducted in 2021. MICS6 is an international household survey program developed by the United Nations International Children's Emergency Fund (UNICEF) in the 1990s. MICS is used to support nations in gathering and analyzing data to address information gaps concerning the well-being of children and women. The extensive application of MICS findings has been instrumental in shaping policy decisions, implementing program interventions, and advocating for public awareness about the conditions of children and women globally (National Bureau of Statistics (NBS)). The MICS education data are part of the MICS-Education Analysis for Global Learning and Equity (MICS-Eagle) initiative, which was developed to assist countries in gaining a comprehensive understanding of their education systems and facilitating data-driven decisions and policies. The MICS-Eagle seeks to maximize the utilization of data generated by MICS6 to enhance education policies and practices to foster better education outcomes for children. MICS6 is the first round of MICS data to include a module on student learning levels. The MICS6 data for Nigeria is funded and developed by UNICEF and carried out by the Nigerian National Bureau of Statistics (NBS).

The data are drawn from a nationally representative sample of 41,532 households, with a response rate of 98.9 per cent (39,632 households interviewed). States were identified as the main sampling strata, and household sampling was implemented in two stages: first, a specified number of census enumeration areas were systematically selected with probability proportional to size within each stratum. Subsequently, a systematic sample of twenty households was drawn from each enumeration area after household listing in the selected enumeration areas. The data were generated from five questionnaires. The education data I use is scattered across two questionnaires: the household questionnaire that contains such information as the list of household members, household characteristics, and a set of education indicators for each household member, and the questionnaire for children aged 5–17 years old (the age for basic education in Nigeria) which contains information on student learning levels and foundational numeracy and literacy skills, and other student characteristics.

A total of 63,941 children aged 5–17 years were sampled within the households, but the questionnaire for children aged 5–17 years was administered to one randomly selected child in each interviewed household, resulting in a total of 22,706 eligible children (98.8 per cent response rate). Information for the children was provided by the mothers/caretakers (22,433 interviewed). For each child, data are collected about the child, their parents, and household to provide a wide variety of information about individual student characteristics, the types of schools they attend, the age at which a child starts school, and the medium of instruction used in the child's school. Household characteristics (including parents' educational information) the language they learn in, and numeracy and literacy skills/attainment. The learning assessments also contain a dimension where students are tested in their indigenous languages, which I use for assessing differences in learning outcomes.

I restrict the analytical sample to students in the first three years of primary school (grades 1–3). This is because the NPE 2013 (which is the focus of this study) states that the mother tongue should be used exclusively till Primary 3, and English be introduced from Primary 4 (FRN, 2013). The MICS module on foundational learning skills also measures learning outcomes expected for students in Grades 2 and 3 in numeracy and literacy. This makes grades 1–3 the most appropriate sample for assessing correlations between language of instruction and learning outcomes (National Bureau of Statistics (NBS) :310). The restricted sample results in a final sample of 11,151 students – 3,868 from grade 1, 4,048 from grade 2, and 3,235 from grade 3.

4.2. Methods

I employ regression models to address the research questions. Initially, I use descriptive analysis to provide an overview of the data, elucidating key patterns. Subsequently, I explore bivariate relationships to illustrate associations between variables. Building upon this, I conduct a multivariate regression analysis, employing controls to adjust for relevant factors and discern the nuanced impact of each variable on the outcomes of interest. For the regression analyses, I report the Average Marginal Effects (AMEs) at means, which indicate the average change in the outcome variable associated with a one-unit change in the predictor variables while holding other variables constant at their mean values. I report AMEs rather than regression coefficients because AMEs provide more meaningful interpretations of the impact of predictor variables on the outcomes. Unlike regression coefficients, AMEs directly quantify the average change in the outcome variable for a one-unit change in the predictor variables, making them more easily interpretable. This approach provides insights into the practical implications of the findings within the context of the sample characteristics.

4.3. Variables

Research Question 1 (RQ1): 1a) Does the implementation of the LOI policy differ between public and private schools in the first three years of primary school? 1b) What factors affect the implementation of the LOI policy?

For RQ1, the main outcome variable is a variable that indicates the language of instruction used by the teacher in the classroom (as shown in Table 2). Respondents could pick between English and eight other languages.[1] There was also an option for 'other languages' for students instructed in a language that was not among the nine options available. I derive a binary variable that indicates whether the instructional language in a student's class is English or an indigenous language. The recategorized variable takes a value of 0 if it is English and 1 if it is an indigenous language. The objective of this variable is to assess if teachers/schools adhere to the general policy of teaching in a non-English language in the first years of primary school.

Table 2
Overview of outcome variables, key explanatory variables and controls for each RQ.

RQ1	**Implementation of policy in Nigeria**	
	Outcome variable	English versus Indigenous language (binary)
	Key explanatory variable	School type
	Controls	Urban-rural residency, Region of residence (controls).
RQ2	**Associations between mother tongue instruction and learning outcomes**	
	Outcome variable	Literacy outcomes (a binary pass or fail variable)
	Key explanatory variable	a) English versus Indigenous language (binary) b)Language of instruction matches home language vs. not (binary)
	Controls	A vector of child, parent, and household characteristics.

The main explanatory variable for RQ1 is the school type a child attends. A student is coded as 1 if they attend a private school and 0 if they attend a public school. In this study, a private school is defined as a school that is not run or managed by a public authority (UNESCO 2018:24). For RQ1a, descriptive and bivariate analyses are conducted to explore the relationship between school type and LOI. This provides valuable insights into the unadjusted associates before controlling for other factors.

For the multivariate regression (RQ1b), controls are included to account for spatial and regional variations that could influence the implementation of the LOI policy. I control for whether a school is located in an urban or rural area. Research by Okebukola et al. (2013) indicates that schools in urban areas are less likely to adopt the LOI policy compared to rural schools. Urban areas are more culturally and linguistically diverse, which may pose challenges for uniform policy implementation (Nwauzor, 2017). Additionally, urban areas might have more pressure to use English as the instructional language due to its higher economic value and great demand in the job market (Alabi, 2021). Controlling for urban-rural residence helps account for these disparities. I also control for the six geopolitical zones, henceforth referred to as regions. These regions are North Central (NC), Northeast (NE), Northwest (NW), Southwest (SW), Southeast (SE), and Southsouth (SS). Previous studies such as those by Ibrahim and Gwandu (2016) and Abiki (2014), suggest that the LOI policy is implemented more in northern than southern regions. Different regions have varying levels of linguistic diversity, with the northern region generally being more homogenous (Higazi et al., 2015). Additionally, regional political priorities and administrative practices can affect policy implementation. Including controls for these zones ensures that the study captures the impact of economic, linguistic, political, and historical factors on the implementation of the LOI policy.

About 90% of the observations had no missing values for any of the variables included in these models. Percentage of missing in all variables ranged from nearly 0 for some demographic variables to as high as 11% for some. Missing data for the primary outcome, LOI, was 1%. After a thorough examination, I determined that the missing data are Missing Completely at Random (MCAR). This means that the likelihood of data being missing does not depend on any observed or unobserved values, ensuring that the missingness does not introduce systematic bias into the analysis. Given that the missing data are MCAR, I opted to use pairwise deletion as the method for handling missing values. Pairwise deletion allows me to retain as much data as possible by excluding missing values only in specific analyses where they are not available.

Research Question 2 (RQ2): a) Are there any associations between the language of instruction in class and student learning outcomes for primary 1–3 students? **b)** Are there any associations between learning specifically in one's mother tongue and student learning outcomes for students?

[1] The three major indigenous languages (Igbo, Yoruba, and Hausa), and five other minor indigenous languages (Fulani, Ijaw, Tiv, Ibibio, Edo)

To answer RQ2, the main outcome variable is the reading and comprehension assessment conducted as part of MICS6. For the literacy assessments, children were given a short story to read, after which they were asked five comprehension questions based on the stories. The stories were available in 4 languages: English and the three major languages. Where available, students were tested in the same language as the language of instruction in class. If the language of instruction in class was not one of the four major languages, students were tested based on the language spoken at home – if it was one of the four languages. Where students could not be matched based on the instructional language in class or the language spoken at home, students were asked to identify which of the four languages they preferred to be tested in.

The literacy assessment is broken into two components:

- Word recognition/ability to read words: A child is proficient if they can correctly read 90 percent of the words in a story.
- Comprehension: A child is proficient in this task if they correctly answered all five questions (composed of three literal and two inferential questions).

Three separate outcome variables are derived based on this. There are two binary variables that identify if a child is proficient in a) reading and b) comprehension based on the definitions above. I also derived a third binary variable called foundationally literate, the main outcome variable for this question, which indicates whether a child attained proficiency in both tasks.

For RQ2a, the main explanatory variable is the language of instruction in the classroom, specifically a variable that indicates whether a child is taught in English or an indigenous Nigerian language. For Research Question 2b, the main explanatory variable indicates whether the language used for instruction in the child's classroom matches the language spoken at home. This variable provides insight into the alignment between the language of instruction in the educational setting and the child's linguistic environment at home.

For both parts of RQ2, I control for a vector of individual child characteristics, parent, and household variables that have been shown to impact students' learning outcomes in Nigeria (Adeniran et al., 2020; Onwuameze, 2013). For child characteristics, I include the child's age as a continuous variable to account for developmental differences in learning outcomes (Hale and Taweel, 1974). I include gender, as studies have shown that boys and girls may perform differently in assessments due to various social and educational factors (Richardson, 1986). I control for the type of school a child attends (public or private) as it can influence the quality of education a child receives. Additionally, reading habits at home, such as whether a child reads books or is read to, are crucial controls because they directly affect literacy skills, which are critical for performing well in assessments where children must read a story correctly (Onwuameze, 2013). I also include two variables in this regard, a binary variable that indicates if a child reads a book at home or not and another binary variable that indicates if someone reads books to a child at home. Including these variables ensures that the analysis captures the direct impact of home literacy practices on student performance.

I also include a vector of parent and household characteristics. I include the parent's education level (separate variables for mother and father education level as Onwuamaeze (2013) found that the mother's education is more strongly associated with students' achievement in literacy and numeracy than the father's education); each variable has four categories: primary school, junior secondary, senior secondary school, and some form of higher or tertiary education. I include the household wealth quintile group as wealth significantly impacts access to educational resources and opportunities, influencing student performance (ibid.). In MICS6, household wealth is calculated as an asset-based index, and I break it down into five quintile groups. Separate wealth scores were used to calculate the wealth quintile groups for urban and rural areas. I include binary variables for urban-rural residence as living in urban or rural areas can affect access to quality education and educational resources, with urban areas often having more advantages (Onwuameze, 2013). I also include a variable for the regions to account for regional differences in educational practices (Onwuameze, 2013).

A disadvantage of using logistic regression is the potential bias induced by differences in the characteristics of students taught in English versus those taught in a native language. For example, students taught in English may come from more affluent backgrounds with better educational resources. To address this issue, I employed propensity score matching (PSM), a quasi-experimental method that helps create a balanced comparison by matching students with similar observed characteristics from both groups, thereby reducing this bias in the estimation of the treatment effect. For the PSM analysis, I used nearest neighbor matching, where each treated student (taught in a native language) was matched with a control student (taught in English) based on the closest propensity score. To ensure a high-quality match, I considered a pair of observations a match if the absolute difference in their propensity scores was less than 0.03. The matching process was conducted without replacement to avoid reusing control units and to maintain the integrity of the comparison. After matching, I estimate the Average Treatment Effect on the Treated (ATET), which measures the impact of being taught in a native language on literacy outcomes for those students who were taught in a native language.

Despite the insights this study provides into LOI instruction in Nigeria, the data and methods impose limitations Despite the insights this study provides into language of instruction (LOI) in Nigeria, the data and methods impose limitations. First, despite employing a quasi-experimental method in the analysis, PSM is limited by its reliance on observed covariates. This means it does not account for unobserved differences, such as students' intrinsic motivation or parental involvement, which could be correlated with school selection or parental decisions. This omission may introduce bias into the impact estimates of LOI on learning outcomes, potentially resulting in overestimation or underestimation of LOI's true effect, particularly as parents may choose schools based on the language of instruction (see Okebukola, 2012). The dataset I use in this study does not easily lend itself to a method that addresses selection induced by unobservable factors. Therefore, in this estimate, I focus on controlling for all available covariates that could impact student outcomes.

Second, the MICS6 data is a cross-sectional dataset, and the findings cannot be generalised over time as they are limited to the period in which the data was collected. Additionally, as it is a household dataset, it does not provide school-level data that could contribute useful insight into both issues of implementation and learning outcomes. Third, using a quantitative approach more generally limits our understanding of how the LOI affects learning outcomes and the specific pathways through which LOI affects learning outcomes. Nonetheless, this study provides new evidence of the association between LOI, learning outcomes, and implementation of the LOI policy.

I summarize the outcome variables, key explanatory variables, and controls in Table 2 below.

4.4. Sample characteristics

4.4.1. RQ1

Table 3 shows that both public and private schools predominantly learn in English. However, the proportion of private school students learning in English is higher (95 percent) than that of public-school students (73 percent). Students in urban and rural areas also predominantly learn in English in school, but with a higher prevalence in urban (88 percent) than in rural areas (73 percent). By region, students in the southern regions also predominantly learn in English. However, in the northern regions, specifically the Northwest (46 percent) and northeast (71 percent). This indicates the dominance of the Hausa language in the northern region of Nigeria.

Table 3
Summary statistics for instructional language (row %) - RQ1 Outcome.

Covariate	English	Indigenous
School Type		
Public	73	27
Private	95	5
Geographical residence		
Urban	88	12
Rural	73	27
Region		
Southwest	93	7
Southeast	97	3
Southsouth	98	2
Northwest	46	54
Northeast	71	29
Northcentral	93	7

Source: MICS6. Summary based on weighted sample.

4.4.2. RQ2

In Table 4, I present summary statistics for the foundationally literate outcome. Table 5 shows that students who learn in English have a pass rate of 48 percent, while those who learn in an indigenous language have a pass rate of 12 percent.

Table 5 shows that in the sample, approximately 79 percent of respondents report that the language spoken at home is one of the four main languages. About 25 percent, 29 percent, 10 per cent, and 15 percent report that the languages spoken at home are English, Hausa, Igbo, and Yoruba, respectively. Between 1 and 2 per cent of respondents report that they speak one of the first-tier indigenous languages at home, specifically Fulani, Ijaw, Tiv, Ibibio, and Edo. Another 14 per cent of the respondents reportedly speak 'other languages,' which in MICS6 is any language other than the one in this paragraph. Looking by school type, the only indigenous language that is used largely in private schools is Hausa. For other languages, they are used predominately more in public schools than in private schools.

5. Results

This section discusses the estimates from the regressions. In Section 5.1, I present the results of RQ1 (implementation of the LOI policy), and RQ2 (associations between LOI and literacy outcomes) in Section 5.2.

5.1. RQ1: Implementation of the LOI policy in public and private schools

For RQ1a, I assess whether the LOI policy is implemented across schools in Nigeria and then analyze the differences between the implementation of the LOI policy in public and private schools using bivariate regression. Table 6 indicates that 81 percent of students in the sample report that the language of instruction in their classroom is English. This suggests that students in all school types are more likely to be taught in English than in an indigenous language. By school type, private schools are more likely to teach in English than in an indigenous language. 95.4 percent of private school students report that the instructional language used in their classroom is English, compared to 73 percent of public school students. The results from the bivariate regression show that private schools are 30 percentage points less likely to use an indigenous language (AME) of c-0.30 compared to the mean of the dependent variable of 0.15 (result in Table A1).

For RQ1b, I assess the factors that affect implementation of the LOI policy, looking at differences in implementation between school types and accounting for differences in urbanisation, region, and state of residence. Table 7 indicates that the interactions between LOI and all the covariates are statistically significant. Private schools are 12 percentage points less likely to use an indigenous language than public schools. The magnitude of the AME (-0.12) is substantial compared to the mean of the dependent variable (0.15), suggesting a meaningful effect. This is consistent with findings from several States in Nigeria and across post-colonial countries (see Okebukola's (2012) study about Lagos, Nigeria; Chattopadhyay and Roy's (2017) study about India). This finding supports research from many post-colonial multilingual countries that claim that one reason for the growth in private schools in such contexts is that parents seek to send their children to schools where the LOI is English. For example, see Muralidharan's and Kremer's (2007) study about India; Rubagumya's (2010) study about Tanzania; see Okebukola's (2012) study about Nigeria.

Table 4
Summary statistics for literacy outcome (foundationally literature) - RQ2 Outcome.

	English	Indigenous	Whole sample
Foundationally literate (% who passed)	48	12	43

Source: MICS6. Summary based on weighted sample.

Table 5
Summary statistics for the language spoken at home (row %) – RQ2b explanatory variable.

Langauge	Whole sample	Private School	Public School
English	25.4	94.0	6.0
Hausa	28.7	45.6	54.4
Igbo	10.0	2.4	97.6
Yoruba	14.7	9.6	90.5
Fulani	1.8	4.6	95.4
Ijaw	1.1	5.3	94.7
Tiv	2.2	18.0	82.0
Ibibio	1.3	1.1	98.9
Edo	0.3	1.2	98.8
Other language	14.4	4.18	95.8

Source: MICS6: Summary based on weighted sample

Table 6
LOI used in public and private schools (Column %) - RQ1 Outcome.

	Public school	Private school
English language	73	95
Indigenous language	27	5
Total	12,159	6,037

Table 7
LOI used in public and private schools by urban-rural residency and region (RQ1 Outcome).

	AME	Std. Error	95% CI	
Covariate				
Private School	-0.12***	0.015	-0.150	-0.089
Geographical residence				
Rural	0.08***	0.014	0.049	0.104
Region				
South West (base)				
South East	-0.06***	0.021	-0.098	-0.015
South South	-0.08***	0.016	-0.112	-0.050
North West	0.36***	0.027	0.309	0.414
North East	0.14***	0.024	0.091	0.185
North Central	-0.03*	0.018	-0.068	0.001
Observation	6,477			

CI: Confidence Interval; *p<0.05, **p<0.01, *** p<0.001; Wald Chi^2 554.40***; Pseudo R^2 0.3035; Mean of dependent variable: 0.15; Source: MICS6

In rural areas, there is a substantial 8 percentage point increase (more than half of the magnitude of the mean of 0.15) in the likelihood of children learning in an indigenous language compared to learning in English. This aligns with findings from other studies in Nigeria and similar contexts that consistently find that mother tongue/indigenous language policies are rarely implemented in urban areas (see Tom--Lawyer et al., 2021) study about Botswana and Nigeria). This could be for a few reasons. For example, there is more language heterogeneity in urban than rural areas (Okebukola, 2012). Another reason is urban parents prefer their children to be taught in English (Tom-Lawyer et al. (2021). This might be in part due to the practical relevance of English in urban areas compared to rural areas. In rural areas, indigenous languages are an integral part of cultural identity and socio-economic means. Therefore, the perception of English as a socioeconomic power is not as strong in rural as in urban areas. Additionally, in rural areas, there tends to be more language homogeneity than in urban areas (Ayenbi, 2014).

Children in the Northern region are more likely than those in the Southern region to learn in an indigenous language, except in the Northcentral. In the Northeast and Northwest regions, children exhibit notably higher probabilities of learning in an indigenous language, with increases of 14 and 36 percentage points, respectively. These findings underscore the pronounced association between regional location and LOI, with the Northwest demonstrating the most substantial relationship observed in the analysis (a large effect size compared to the mean indicating a significant impact on instructional language). This could be because English is a more dominant language in Southern regions than in Northern regions (except the North Central, where Abuja, the capital of Nigeria, is located). This can be attributed to various historical and socioeconomic factors. For example, during colonial times, missionary activity, which played a significant role in spreading formal English, was concentrated in the South, leading to the lopsided development of English language use and proficiency between the Southern and Northern regions (Adetugbo, 1978). As mentioned in Section 2.1, Hausa is also the dominant language in Northern Nigeria and is spoken by over a quarter of Nigerians, most of whom reside in the Northern region (Ayenbi, 2014). As such, there is more language homogeneity in the North (in the sense that residents share one language other than English).

Furthermore, the subgroup analysis in Table 8 reveals variations across grade levels, indicating that the disparity between public and private schools in implementing the LOI policy diminishes as children progress from primary 1. Specifically, the Average Marginal Effect (AME) suggests a small difference in primary 1 (-5.7 percentage points). This difference becomes more pronounced in grades 2 and 3, with AMEs of approximately -15 and -16 percentage points, respectively, approximately equal to the magnitude of the mean of the dependent variable for each grade sub-sample, as shown in Table 8.[2] This finding indicates a sharp decline in the use of indigenous language teaching in private schools compared to public schools.

I show coefficient plots by school type for the covariates in Fig. 1 below. The AME for rural areas remains positive for both public and private schools. Similarly, the AME is positive and significant for public and private schools in the NE and NW regions.

5.2. RQ2a: associations between LOI and learning outcomes (English vs indigenous language)

For the logistic regression, I report the AME indicating the probability that a student will pass or fail the assessment. The results in Table 7 suggest that children who learn in an indigenous language are 10 percentage points less likely (-0.10 AME) to pass the literacy assessment than those who learn in English (a small effect relative to a mean of 0.40).[3] When the literacy assessment is disaggregated into its components (see Table A1 in the appendix), the findings reveal significantly higher reading comprehension scores in English than in indigenous languages. Specifically, children learning in an indigenous language are 10 percentage points less likely to pass the comprehension exercise than their counterparts learning in English. However, for the reading component of the assessment, the effect is relatively smaller at 7.5 percentage points. This suggests a complex relationship between the language of instruction and literacy outcomes. The observed disparity in comprehension performance between languages may reflect the advanced cognitive skills and linguistic proficiency required to comprehend and answer questions effectively compared to the skills required for reading.

Tables 9 and 10 indicates no statistically significant difference between students learning in English versus an indigenous language during the first year of primary school. However, distinctions become apparent in Primary 2 and 3, where students in both grades are 11 percentage points less likely to pass the literacy assessment. This suggests a progressive divergence in academic outcomes between students taught in English and those taught in an indigenous as they advance through primary education.

The results from the PSM (Table 11) corroborate the findings from the logistic regression, indicating that being taught in a native language reduces literacy outcomes by 13 percentage points. When literacy assessments are divided into components, the findings remain consistent, with higher reading comprehension scores for children taught in English versus an indigenous language. The robustness of this result was confirmed through several sensitivity tests, including balance checks and multiple imputation for missing data. I examined the standardized mean differences of the covariates before and after matching and found that all standardized mean differences were below the recommended threshold of 0.1 after matching, indicating a good balance between the treatment and control groups.

However, the variance ratios for urban/rural residency were outside the acceptable range of [0.85, 1.18] after matching, suggesting potential residual confounding. To address this, I conducted a subgroup analysis for urban and rural areas individually (Table 11). The Average Treatment Effect on the Treated (ATET) for urban areas was -0.20, indicating a 20-percentage point lower literacy outcome for students taught in a native language compared to those taught in English. For rural areas, the ATET was -0.09, indicating a 9-percentage point reduction. These findings suggest that the negative impact of being taught in a native language is more pronounced in urban areas than in rural areas.

The finding from the logistic regression and PSM contradicts the evidence and consensus that teaching children in their L1 is the most efficient way to advance their learning. However, some important factors surrounding the use of language in class and the language of tests are relevant to understanding the significance of the conclusions drawn here. First, given the preponderance of English used as the language of instruction, as shown above in Section 5.1, it is unsurprising that students who learn in English have better learning outcomes than their counterparts who learn in an indigenous language. The differences in outcomes between students in Primary 1 and those in Primary 2 and 3 indicate how differences emerge after students have been immersed in schools (with English instruction) and how that is associated with student learning outcomes.

[2] Note that the sample size is reduced when the analysis is done by grade, especially for the indigenous language category. The smaller sample size in these subgroups may compromise the reliability and generalizability of my findings, as statistical power could be reduced, leading to less precise estimates of effects. Despite this limitation, the findings provide valuable insights.

[3] After conducting a separate analysis focusing solely on the Northern region of Nigeria, where higher levels of implementation of the Language of Instruction (LOI) policy were observed, the findings mirrored those of the entire sample, indicating an effect size of -0.11 Average Marginal Effects (AME). In light of this consistency, I chose to report the results from the entire sample.

Table 8
LOI used in public and private schools by grade (RQ1 Outcome).

English vs. Indigenous Language	Primary 1		Primary 2		Primary 3	
	AME	Std. Error	AME	Std. Error	AME	Std. Error
Public (base)						
Private	-0.057**	0.024	-0.149***	0.027	-0.155***	0.028
Observation	1,996		2,358		2,123	

CI: Confidence Interval; *p<0.05, **p<0.01, *** p<0.001; Wald Chi^2 253.96***; Pseudo R^2 0.3413; Mean of dependent variable: P1 – 0.13; P2 – 0.17; P3 – 0.16; I controlled for all the variable included in the previous regressions: rural/urban residency, and region of residence. Source: MICS6

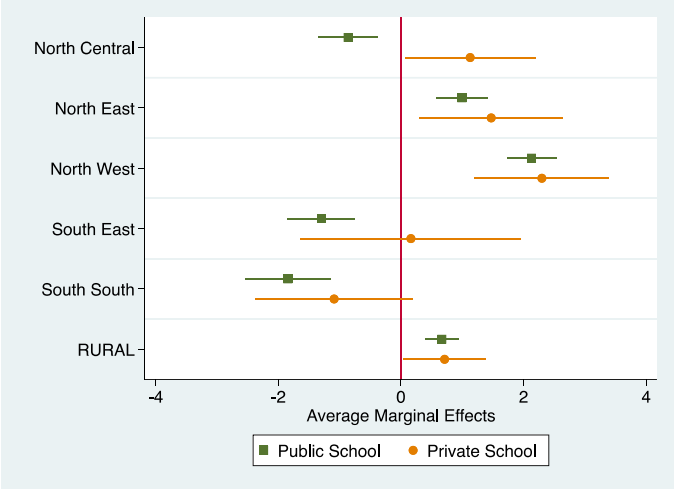

Fig. 1. Coefficient plots – LOI used in public and private schools (RQ1 Outcome).

Second (and relatedly), the assessments were only available in English and the three major indigenous languages (Igbo, Hausa, and Yoruba). Therefore, the disadvantage for indigenous language-taught students could be reflecting the fact that many students who were taught in an indigenous language were not assessed in a language they were familiar it (that is, either spoke at home or were taught in school). Unfortunately, it was not possible to assess student performance in English versus the three main indigenous languages, as the sample sizes for two of the languages were small – Igbo (6 students) and Yoruba (77 students), compared to 5,475 students who learn in English. However, to investigate whether student performance in the tests is associated with the language they take the test in, I assessed how students performed when they tested in the same language they were taught in school versus their counterparts who tested in a different language. The findings indicate that students who took the assessment in the same language as they were taught in school are about 5 percentage points more likely to perform better than those who took it in a different language. The difference in results for reading and comprehension support this. While students might be able to identify words and read in a language other than the language they are taught or speak at home, their understanding of that language is limited as they cannot critically reason in these languages or understand what they read.

Third, the poor performance of students who learn in indigenous languages could also reflect a lack of materials/qualified teachers to teach in the language. As Ibrahim and Gwandu (2016) and Trudell (2018) note, there is a dearth of competent and qualified teachers equipped to teach students in indigenous languages. Where teachers are available, they often do not receive appropriate training and do not have access to relevant materials for teaching in indigenous languages, as most textbooks used in primary schools are written in English. As a result, even when a teacher teaches in indigenous languages, the lack of skills combined with the lack of material makes it difficult to teach students efficiently and effectively in an indigenous language.

Table 9
Associations between LOI and literacy outcomes -foundational literate (RQ2 Outcome).

Covariate	AME	Std. Error	95% CI	
Language of instruction				
English (base)				
Indigenous	-0.101***	0.038	-0.176	-0.025
Private School	0.052**	0.020	0.013	0.091
Age	0.063***	0.003	0.057	0.069
Female	0.004	0.017	-0.029	0.037
Does not Read books	-0.220***	0.030	-0.277	-0.162
Father's education				
Primary	-0.005	0.036	-0.077	0.066
Junior Sec	-0.100	0.049	-0.197	-0.003
Senior Sec	-0.005	0.036	-0.076	0.065
Higher/tertiary	0.015	0.038	-0.063	0.090
Mother's education				
No education (base)				
Primary	0.009	0.028	-0.047	0.065
Junior Sec	0.028	0.042	-0.055	0.111
Senior Sec	0.029	0.030	-0.031	0.088
Higher/tertiary	0.123***	0.037	0.050	0.196
Wealth group				
Poorest (base)				
Second	0.034	0.035	-0.035	0.103
Third	0.064*	0.036	-0.006	0.133
Fourth	0.139***	0.037	0.066	0.211
Richest	0.253***	0.040	0.174	0.331
Geographical residence				
Urban(base)				
Rural	-0.061***	0.021	-0.102	-0.018
Region				
South West (base)				
South East	0.053	0.032	-0.010	0.115
South South	-0.048	0.029	-0.105	-0.009
North West	-0.136***	0.033	-0.201	-0.072
North East	-0.072**	0.035	-0.141	-0.002
North Central	-0.049**	0.024	-0.096	-0.003
Observations	5,157			

CI: Confidence Interval; *p<0.05, **p<0.01, *** p<0.001; Wald Chi^2 634.23***; Pseudo R^2 0.320; Mean of dependent variable: 0.40; Source: MICS6

5.3. RQ2b: associations between LOI and learning outcomes (LOI alignment with home language)

This study initially focused on the impact of learning in indigenous languages versus English. However, the existing evidence based on mother tongue instruction underscores that students achieve better learning outcomes when learning occurs in the same language as they speak at home. Therefore, to capture this more comprehensively, I introduced another outcome variable, "same language," indicating whether a child's instructional language aligns with their home language. This variable, derived from the MICS6 dataset, reflects whether a student predominantly speaks the same language at home as the one used by their teacher in the classroom.

The analysis (Tables A5-A6) underscores the positive impact of learning in the same language spoken at home, indicating an approximate 4 percentage point increase in learning outcomes. Although a small effect compared to the mean of 0.40, this aligns with evidence suggesting that instruction in the first language (L1) can enhance learning

Table 10
Associations between LOI and learning outcomes by grade - foundationally literate (RQ2 Outcome).

English vs. Indigenous Language		Primary 1		Primary 2		Primary 3	
		AME	Std. Error	AME	Std. Error	AME	Std. Error
English (base)							
Indigenous		-0.100	0.076	-0.110**	0.050	-0.110*	0.064
School Type							
	Private	0.046	0.034	0.027	0.031	0.075**	0.035
	Observations	1,605		1,865		1,675	

CI: Confidence Interval; *p<0.05, **p<0.01, *** p<0.001; Mean of dependent variable: P1 - 0.46; P2 -0.39; P3 – 0.36; I controlled for all the variable included in the previous regressions; Source: MICS6

Table 11
ATET estimates for literacy outcomes using PSM.

English vs. Indigenous Language		Full Sample		Urban		Rural	
		ATET	Robust Std. Error	ATET	Robust Std. Error	ATET	Robust Std. Error
English (base)							
Indigenous		-0.128***	0.023	-0.09***	0.044	-0.20***	0.026
	Obs.	1,605		2,070		3,087	

*p<0.05, **p<0.01, *** p<0.001; I included all the covariates from the logistic regression; Source: MICS6

outcomes. Notably, the adjusted marginal effects (AMEs) for reading and comprehension remain similar, suggesting no disparity in performance between reading and understanding.

However, amidst Nigeria's linguistically diverse landscape, it is crucial to acknowledge the policy shift in November 2022 towards indigenous language instruction. While 40 percent of students in the sample currently learn in their home language, a significant majority (approximately 89 percent) of these students identify English as their home language. Thus, the observed results may not accurately reflect outcomes under the new policy, where many students will learn in indigenous languages that are not their mother tongue. These findings underscore the intricate interplay between language congruence, educational settings, and learning outcomes, highlighting the need for nuanced approaches in policy implementation to accommodate Nigeria's linguistic diversity effectively.

6. Discussion and conclusions

The objectives of this study were twofold. First, to assess the differences in the implementation of the LOI policy between public and private schools in (RQ1), and second, to investigate associations between LOI and student learning outcomes (RQ2). The data I used was collected between 2020 and 2021 before the implementation of the new LOI policy that mandates that an indigenous language is used all 6 years of primary school; therefore, the results reflect the conditions and practices under the old policy.

The findings from RQ1 indicate higher LOI policy implementation levels in public than private schools. It reveals that 81 per cent of students are taught in English, with a notable difference between private (95.4 percent) and public schools (73 percent). Additionally, factors such as urbanization and region of residence significantly affect LOI policy implementation, with private schools and urban areas showing a higher likelihood of English instruction. In contrast, rural areas and Northern regions (except North Central) exhibit a greater tendency to use indigenous languages, reflecting regional language homogeneity and historical influences.

A key takeaway from the results is the significant gap between policy formulation, implementation, and enforcement. While the federal government sets out rules and guidelines regarding language of instruction (LOI) policies, my research highlights a critical gap in implementation: the lack of monitoring and enforcement mechanisms. Despite the stipulated rules, the absence of robust monitoring frameworks undermines the effective execution of these policies. This finding underscores a broader issue wherein policymakers may prioritize policy formulation over enforcement, potentially leading to a significant disconnect between policy intentions and on-the-ground realities. The implications of this gap are profound, as it suggests that even well-designed policies may fail to achieve their intended outcomes without adequate mechanisms for monitoring and enforcement. In addition, the results underscore the limitations of top-down policy approaches in such a diverse country. Such centralized policies often neglect the diverse needs and contexts of local communities, resulting in gaps between policy intentions and on-the-ground realities. Decentralization (with federal oversight) offers a promising avenue for addressing the complexities associated with policies deeply intertwined with state or regional dynamics. In Nigeria's context, where primary education administration is partially decentralized, empowering local authorities to tailor education policies to their specific regional needs can lead to more responsive and contextually relevant education systems.

The findings from RQ2a indicate that students taught in indigenous languages are 10 percentage points less likely to pass the literacy assessment than those who learn in English, seemingly challenging conventional knowledge. This gap widens by Primary 2 and 3, where students are 11 percentage points less likely to pass if taught in an indigenous language. However, results from RQ2b, which assesses associations between learning in the same language spoken at home and students' learning outcomes, show that a higher positive outcome is associated with learning in the same language spoken at home, though the effect is small at 4 percentage points (compared to a mean of 0.40).

A key takeaway from the results of RQ2 is the importance of generating context-specific evidence in understanding how LOI is associated with learning and the relevance of tailoring educational policies to local contexts. For Nigeria, this departure from the norm requires careful consideration within the nation's unique socio-linguistic landscape. While my results suggest a potential benefit of English instruction, the low level of implementation of the LOI policy complicates the interpretation of these findings. Therefore, this discrepancy could underscore the challenges of implementing a uniform mother tongue instruction policy in a country with over 500 distinct languages. The incongruity necessitates the reconsideration of generalized conclusions from studies conducted in less linguistically diverse settings, as lessons from such contexts may not readily translate to the Nigerian context. It also calls for a nuanced understanding of the relationship between instructional language and learning outcomes, especially in linguistically diverse contexts.

The significance of context specificity is further underscored by the notable variation in the implementation of the LOI policy between the northwest and northeast regions as compared to other parts of Nigeria.

This disparity emphasizes the necessity for tailored approaches to implementation, as the unique needs and circumstances of different regions must be considered. Without tailoring educational policies to accommodate diverse contexts, initiatives promoting mother tongue instruction may fail to realize their intended objectives.

Overarchingly, the findings of my study are directly relevant to Nigeria's new LOI policy, which was introduced in November 2022. Despite its announcement, official documentation outlining the specific details of the policy has yet to be released, leaving uncertainty surrounding its implementation. Though previous iterations of the LOI policy are vague in terms of defining how the instructional language should be selected, the findings of this study underscore the critical need for clear and comprehensive guidelines and context-specific interventions aimed at enhancing policy implementation. As the government formulates guidelines for the policy, it is imperative to solicit insights from experts and stakeholders. A transition towards teaching in a child's mother tongue in the early years of schooling requires a nuanced approach informed by both quantitative research, as provided in this study, and informed public dialogue with education stakeholders to assess the efficacy and feasibility of such a policy shift.

The observed lack of adherence to the policy underscores the imperative for policymakers to carefully examine the issues highlighted in the research I reported in Section 3.1 on factors identified to limit the implementation of the LOI policy. For example, Ibrahim and Gwandu (2016) found that many teachers are unaware of the policy, and there are logistical and resource constraints, such as the availability of qualified teachers and teaching materials.

Consequently, a key policy implication is that policymakers must prioritize resource provision, noting that resource needs will differ by region. Additionally, as many indigenous languages are rarely used in classrooms, ensuring teachers are aware of the policy emerges as another critical area of focus. The urgency to invest in pedagogical resources and training, encompassing both English and indigenous languages, underscores a critical policy implication (Macaulay, 2023). This requires strategic investments in teacher capacity building, curriculum development, and creating relevant educational materials in indigenous languages. The recent launch of new early-grade learning books in Igbo and Yoruba by the United States Agency for International Development (USAID) provides a promising direction for addressing resource limitations in multilingual education (Oyeniran, 2021).

Additionally, a phased implementation approach emerges as a crucial policy implication of such a [policy in Nigeria's linguistically diverse context. By introducing the policy gradually across regions, policymakers can effectively address region-specific challenges while allowing time for developing and distributing necessary resources and teacher training. Starting implementation in regions my research has identified to have higher adherence levels, particularly in linguistically homogeneous areas like rural and Northern regions, can serve as a strategic start. This allows policymakers to leverage existing successes and establish models of best practices that can be scaled up and adapted for broader implementation. Such a methodical approach enables policymakers to monitor progress and make informed adjustments as required.

Finally, further research is required to understand the relationship between LOI and student learning outcomes fully. More research is required to identify if the themes emerging in this study are consistent over time in Nigeria and if the themes are apparent in similarly multilingual countries. Further research employing an experimental or quasi-experimental design, coupled with suitable data, is essential to augment the findings of this study. These rigorous research designs can provide stronger evidence of causal relationships between LOI policies and learning outcomes, allowing for more robust conclusions regarding the effectiveness of different instructional approaches.

Additionally, integrating qualitative insights alongside quantitative analyses can provide richer context and potentially generate hypotheses to elucidate the intricate relationship between LOI policies and learning outcomes.

Author statement

I, Thelma Obiakor, am the sole author of the research paper titled "**Language of Instruction Policy in Nigeria: Assessing early-grade implementation and literacy achievement in a multilingual environment."** This paper represents my original work and contributions to the field of International Education Development. This article is parto f my PhD thesis, supported by the LSE PhD studentship Award, under the supervision of Prof. Stephen Jenkins and Prof. Anne West. I am deeply grateful to my supervisors for their unwavering support, insightful comments, and feedback. I also extend my thanks to the editor and anonymous referees for their valuable comments.

CRediT authorship contribution statement

Thelma Ebube Obiakor: Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Conceptualization.

Appendices

Table A1
LOI implementation in public versus private schools (bivariate regression for RQ1a)

	AME	Std. Error	95% CI	
Covariate				
Private School	-0.22***	0.013	-0.245	-0.198
Observations	6,477			

CI: Confidence Interval; *p<0.05, **p<0.01, *** p<0.001; Wald Chi^2 147.11***; Pseudo R^2 0.0867; Mean of dependent variable: 0.15; Source: MICS6

Table A2
Associations between LOI and literacy outcomes (word comprehension and reading)- RQ2a Outcome

English vs. Indigenous language	Read 90 percent of words correctly		Answered 5 comprehension questions correct	
English (base)	AME	Std. Error	AME	Std. Error
Indigenous language	-0.075**	0.031	-0.101***	0.038
School Type				
Private	0.073***	0.021	0.055***	0.020
Observations	5,519		4,891	
Mean of Dep. Variable	0.47		0.43	

CI: Confidence Interval; *p<0.05, **p<0.01, *** p<0.001; I controlled for all the variable included in the previous regressions: rural/urban residency, and region of residence. Source: MICS6

Research question 2b: LOI in public versus private school – same language variable

The results reveal noteworthy insights. Firstly, Tables A3-A4 in the appendix show that attendance at private schools increases the likelihood of instructional language alignment with the home language by 5 percentage points (a small magnitude compared to the mean of 0.33). However, this association is attributed to the prevalence of English instruction in private schools, where a significant portion of students predominantly speak English at home. For instance, 60% of private school students primarily speak English at home, compared to only 2.5% in public schools. This disparity underscores the greater likelihood of private school students learning in a language congruent with their home environment, particularly considering that over 80% of students in these schools are taught in English.

Furthermore, research from specific regions in Nigeria, such as the study by Deji-Afuye and Obadare (2014) in Ekiti, substantiates this trend, indicating a higher exposure to English at home among private school students.

Table A3
LOI in public and private schools: LOI aligns with home language versus not.

	Whole sample	Public school	Private school
Same language	40	39	42
Not same language	60	61	58
Total	18,238	12,200	6,037

Source: MICS 6. Summary based on the weighted sample. Numbers in column percentages

Table A4
Implementation of LOI Policy in Public and Private: Language alignment

Covariate	AME	Std. Error	95% CI	
Same language vs not				
School Type				
Private	0.047**	0.022	0.004	0.090
Geographical residence				
Rural	-0.096	0.020	-0.135	-0.058
Region				
South West (base)				
South East	-0.146***	0.040	-0.225	-0.066
South South	0.106***	0.032	0.043	0.169
North West	0.200***	0.031	0.139	0.262
North East	-0.082	0.030***	-0.141	-0.022
North Central	-0.092	0.026***	-0.144	-0.041
Observations	6,494			

CI: Confidence Interval; *p<0.05, **p<0.01, *** p<0.001; Wald Chi^2 169.33***; Pseudo R^2 0.0527; Mean of dependent variable: 0.33; Source: MICS6

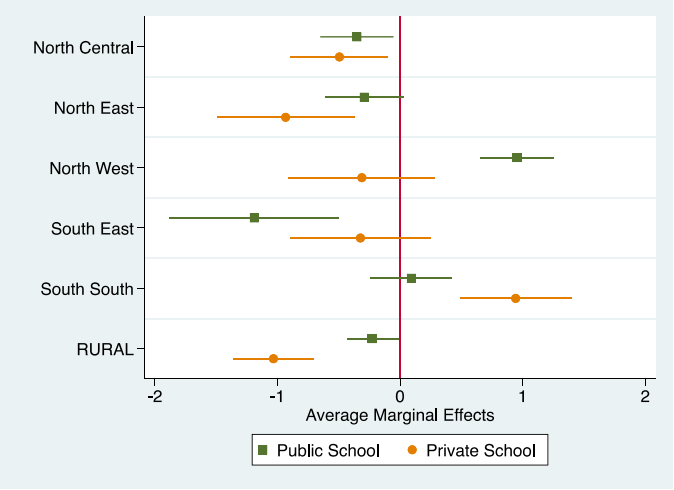

Figure A1. Coefficient plots: Implementation of LOI – LOI Alignment with home language.

Table A5
Associations between LOI and literacy outcomes (foundationally literate) – RQ2b Outcome.

Covariate	AME	Std. Error	95% CI	
Language of instruction				
Not Same (base)				
Same language	0.037**	0.019	0.011	0.075
Private School	0.055***	0.020	0.015	0.094
Age	0.064***	0.003	0.057	0.070
Female	0.004	0.016	-0.029	0.038
Does not Read books	-0.226***	0.029	-0.283	-0.1690
Father's education				
No education (base)				
Primary	-0.006	0.036	-0.078	0.065
Junior Sec	-0.111	0.050	-0.208	-0.013
Senior Sec	-0.006	0.004	-0.076	0.065
Higher/tertiary	0.016	0.038	-0.059	0.091
Mother's education				
No education (base)				
Primary	0.014	0.028	-0.041	0.068
Junior Sec	0.040	0.042	-0.045	0.121
Senior Sec	0.040	0.030	-0.021	0.097
Higher/tertiary	0.129***	0.037	0.055	0.202
Wealth group				
Poorest (base)				
Second	0.039	0;034	-0.028	0.106
Third	0.072**	0.035	0.003	0.139
Fourth	0.144***	0.037	0.072	0.215
Richest	0.258***	0.040	0.180	0.336
Geographical residence				
Urban(base)				
Rural	-0.058***	0.021	-0.099	-0.016
Region				
South West (base)				
South East	0.060*	0.033	-0.004	0.125
South South	-0.050*	0.029	-0.108	0.007
North West	-0.165***	0.032	-0.227	-0.103
North East	-0.075**	0.035	-0.143	-0.007
North Central	-0.043*	0.024	-0.090	0.004
Observations	5,158			

CI: Confidence Interval; *p<0.05, **p<0.01, *** p<0.001; Wald Chi^2 639.60***; Pseudo R^2 0.3188; Mean of dependent variable:0.40; Source: MICS6

Table A6
Associations between LOI and learning outcomes by grade - foundationally literate (RQ2b Outcome)

		Primary 1		Primary 2		Primary 3	
		AME	Std. Error	AME	Std. Error	AME	Std. Error
Not Same (base)							
Same language		0.030	0.032	0.032	0.032	0.030	0.029
School Type							
	Private	0.048	0.034	0.029	0.031	0.080**	0.036
	Obvs.	1,605		1,865		1,676	
	PsuedoR^2	0.3371		0.3213		0.3288	
	Wald Chi^2	285.24***		279.34***		223.63***	

CI: Confidence Interval; *p<0.05, **p<0.01, *** p<0.001; Mean of dependent variable: P1 - 0.46; P2 -0.39; P3 – 0.36; I controlled for all the variable included in the previous regressions. Source: MICS6

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