

Quantitative Analysis of the Impact of the English-Yoruba Parallel-Alphabets Package (EYPAP) on Bilingual Reading Proficiency among Primary One Pupils in Nigeria

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Abstract

This study examined the impact of the English-Yoruba Parallel-Alphabets Package (EYPAP) on bilingual reading proficiency among primary one pupil in Ondo State, Nigeria. A quasi-experimental research design was employed which allowed for the comparison of treatment and control groups under real-world classroom conditions, involving 140 pupils (68 in the EYPAP group and 72 in the control group), with reading skills assessed using pre-test and post-test measures through multi-stage sampling procedure. Data were analysed using Analysis of Covariance (ANCOVA) statistics. The results confirmed EYPAP's significant effect, with pupils in the experimental group achieving a mean gain that surpasses the control groups. No gender differences were observed Male and female pupils showed similar post-test scores. The study concluded that the English-Yoruba Parallel-Alphabets Package (EYPAP) significantly enhances bilingual reading proficiency among primary one pupil in Ondo State. It was recommended that integrating EYPAP into bilingual education policies to enhance literacy development in multilingual settings, ensuring inclusive and effective language instruction.

Keywords: Bilingual Reading, Pupils, Quantitative Analysis, English-Yoruba Parallel-Alphabets Package, Proficiency

Introduction

Bilingual education has gained significant recognition for fostering cognitive, linguistic, and academic growth in multilingual environments. In regions like Ondo State, Nigeria, where multiple languages coexist, bilingual education becomes even more crucial for bridging linguistic gaps and supporting the academic success of pupils (Ogunyemi, 2023). Bilingualism facilitates proficiency in both the mother tongue and a second language and contributes to cognitive flexibility, problem-solving skills, and enhanced cultural identity (Lindholm-Leary, 2019). As Nigeria's educational system strives to integrate local languages alongside English, using instructional tools designed to teach both languages concurrently become imperative (Ibrahim & Gwandu, 2016). One such tool is the English-Yoruba Parallel-Alphabets Package (EYPAP), which aims to bridge the gap between the Yoruba language (the mother tongue) and English, improving pupils' bilingual reading proficiency.

The impact of EYPAP on bilingual reading proficiency among primary school pupils in Ondo State, Nigeria, will be assessed in this entry. Specifically, there will be the evaluation of how EYPAP influences pupils' abilities to decode and pronounce words in both Yoruba and English, as well as its effectiveness in promoting bilingual development compared to conventional teaching methods (Isaiah, 2023). With bilingualism being a significant educational goal, understanding how tools like EYPAP can support reading development in both languages is critical (Oshchepkova et al., 2023).

Bilingual education has become crucial in the global educational landscape, especially in multilingual societies. In countries like Nigeria, where multiple languages coexist, bilingualism is not just an advantage but a necessity for effective communication and cognitive development

(Okunrinmeta, 2024). In particular, integrating indigenous languages with global languages like English has garnered significant attention due to its potential to enhance literacy and cognitive skills (Li et al., 2021). However, challenges remain in ensuring pupils develop proficiency in both languages, particularly in primary education settings where foundational skills are established (Ma, 2023).

In Ondo State, Nigeria, many pupils face a dual-language learning environment where English is taught alongside Yoruba, their native language. Despite the importance of mastering both languages, many educational systems in Nigeria still primarily focus on English, often to the detriment of pupils' first language, Yoruba (Obiakor, 2024). As a result, children may struggle with their mother tongue and English, impeding their ability to read, write, and fully engage in academic settings (Photo et al., 2024). This linguistic gap between English and Yoruba has been identified as a significant challenge in the academic performance of bilingual pupils (Tsojon & Aji, 2014).

The English-Yoruba Parallel-Alphabets Package (EYPAP) was designed as a bilingual instructional tool to bridge this gap, providing a structured approach for teaching both Yoruba and English alphabets simultaneously. This instructional package aims to enhance bilingual reading proficiency by addressing pupils' phonological and orthographic challenges when learning to read in both languages (Novita et al., 2022). The EYPAP focuses on leveraging the similarities and differences between English and Yoruba to facilitate smoother transitions in reading proficiency.

This study aimed to assess the effectiveness of the EYPAP in improving bilingual reading skills among primary one pupils in Ondo State. Specifically, the study examined how the EYPAP compares with conventional teaching methods to enhance pupils' ability to decode and comprehend Yoruba and English words (Nafis & Nasri, 2024). The research explored whether the EYPAP could provide a more effective bilingual education framework than the current teaching practices.

Research Questions

The study concerns the following research questions:

1. How does the EYPAP affect bilingual reading proficiency in primary one pupils compared to traditional teaching methods?
2. What are the observed improvements in reading skills in Yoruba and English for pupils exposed to EYPAP?

Research Hypothesis

The null hypothesis (H₀) driving this study posits that

H₀: There is no significant difference between the reading skills of pupils exposed to EYPAP and Conventional method

Theoretical Background

Bilingual education is a critical aspect of literacy development in multilingual societies. It plays a fundamental role in ensuring pupils acquire proficiency in both their first language (L1) and second language (L2), enhancing cognitive flexibility, academic performance, and cultural preservation. This section explores the theoretical foundations of bilingual education, previous research on the effectiveness of bilingual instructional tools, and key issues affecting bilingual reading proficiency.

Theories of Bilingual Education and Language Proficiency

Several linguistic and educational theories underpin the understanding of bilingual education and its effects on reading proficiency. One of the most relevant is the Contrastive Analysis Theory (CAT) (Lado, 1957), which posits that similarities between two languages facilitate second language acquisition, while differences may cause learning difficulties. This theory suggests that positive transfer occurs when two languages share similar phonological or syntactic structures, making learning easier (Al-Khresheh, 2016). Conversely, negative transfer—when differences between languages create learning barriers—can result in difficulties with pronunciation, reading comprehension, and grammatical construction (Olawe, 2021).

In the context of the English-Yoruba Parallel-Alphabets Package (EYPAP), the Contrastive Analysis Theory provides a useful framework for understanding how Yoruba-speaking pupils acquire literacy skills in English and Yoruba. Since Yoruba and English differ in their phonetic systems, particularly in vowel and consonant sounds, some phonological interference may occur, making bilingual reading challenging (Tsojon & Aji, 2014). However, structured bilingual instruction, such as EYPAP, can help mitigate these challenges by explicitly teaching pupils the differences and similarities between the two languages (Hasanzadeh, 2024).

Another influential theory is Cummins' (1979) Linguistic Interdependence Hypothesis, which states that proficiency in a first language supports acquiring a second language. Cummins (2021) states that strong L1 skills provide a foundation for developing L2 literacy, as cognitive and linguistic abilities transfer across languages. This theory supports bilingual instructional tools like EYPAP, which build on pupils' knowledge of Yoruba to facilitate English language learning (Maye & Wells, 1996).

Previous Studies on the Effectiveness of Bilingual Instructional Tools

Research has consistently shown that bilingual instructional methods improve literacy outcomes for pupils learning in multilingual settings. Lindholm-Leary (2019) found that structured bilingual education programs improve cognitive development, literacy skills, and academic performance. Similarly, Garcia & Velasco (2014) demonstrated that pupils in bilingual education programs perform better in reading comprehension than those in monolingual programs, particularly when instructional methods support both languages rather than privileging one over the other.

Studies on mother-tongue-based education also highlight the effectiveness of bilingual instructional tools. For example, Gacheche (2010) found that literacy programs incorporating the first language significantly improved pupils' reading and comprehension skills compared to those taught exclusively in a second language. This aligns with the findings of Igbojinwaekwu and Dorgu (2015), who reported that interactive bilingual teaching methods engage pupils more effectively and foster better reading outcomes.

In Nigeria, research by Abijo (2014) indicated that using bilingual teaching aids helps bridge linguistic gaps between English and indigenous languages, improving pupils' reading fluency and comprehension. Similarly, Adeleye and Ogunremi (2017) found that culturally relevant instructional strategies, such as parallel alphabet packages, enhance pupils' engagement, motivation, and language acquisition. The present study builds on these findings by examining the impact of the EYPAP on bilingual reading proficiency in primary one pupils in Ondo State.

Key Issues in Bilingual Education: Language Gaps, Reading Proficiency, and Bilingual Development

Despite the benefits of bilingual education, several challenges persist. One major issue is the language gap, where pupils struggle to transition between their L1 and L2 due to phonological, syntactic, or orthographic differences (Cummins, 2021). This issue is particularly prevalent in Nigeria, where many pupils grow up speaking Yoruba at home but are required to learn and read in English at school (Deji-Afuye & Obadare, 2021). Without structured bilingual support, these pupils may experience difficulties in both languages, leading to poor literacy outcomes (Tsojon & Aji, 2014).

Another key issue is reading proficiency. Pupils in bilingual settings may struggle with decoding words, pronunciation, and comprehension, particularly when faced with differences in writing systems and pronunciation rules. According to Keshavarz and Khamis (2017), pupils often transfer phonetic and grammatical rules from their first language when reading in a second language, leading to errors in pronunciation and comprehension. Bilingual instructional packages like EYPAP aim to mitigate these issues by providing structured guidance on phonetic distinctions between Yoruba and English.

Bilingual development is influenced by how both languages are integrated into the

curriculum. Research by Garcia (2015) suggests bilingual education is most effective when both languages receive equal attention and reinforcement. However, in many educational systems, English is often prioritised over indigenous languages, leading to subtractive bilingualism—where pupils lose proficiency in their mother tongue while struggling to master English (Olaoye, 2005). This study investigates how EYPAP addresses this issue by simultaneously reinforcing Yoruba and English literacy skills.

Theoretical perspectives and previous research highlight the significant role of bilingual education in improving literacy skills. The Contrastive Analysis Theory and Linguistic Interdependence Hypothesis provide a strong foundation for understanding the benefits of structured bilingual instruction (Khansir & Pakdel, 2019). Empirical studies further demonstrate that bilingual instructional tools enhance reading proficiency, engagement, and cognitive development (Obasi, 2024). However, key challenges—such as language gaps, reading proficiency issues, and the dominance of English in education—necessitate innovative solutions like the EYPAP (Sharjeel et al., 2018). This study contributes to the existing literature by assessing the effectiveness of EYPAP in addressing these challenges and improving bilingual reading skills among primary pupils in Ondo State.

Methods

This study employed a quasi-experimental research design to assess the impact of the English-Yoruba Parallel-Alphabets Package (EYPAP) on bilingual reading proficiency among primary one pupils in Ondo State. The methodology was structured to comprehensively analyze how EYPAP influenced pupils' reading skills compared to conventional teaching methods (Soeuy & Meng, 2022). This section details the research design, sample selection, data collection methods, and statistical techniques used for analysis.

Quasi-Experimental Design and Its Relevance to the Study

A quasi-experimental design was selected due to its effectiveness in educational research where random assignment is impractical. This design allows for the comparison of treatment and control groups under real-world classroom conditions while accounting for pre-existing differences among pupils (Campbell & Stanley, 1963). In this study, the pre-test, post-test non-equivalent group design was employed, meaning that the experimental and control groups were pre-tested before and post-tested after the intervention.

This design was appropriate because:

1. It controls for pre-existing differences: By measuring reading proficiency before and after the intervention, the study could isolate the effects of EYPAP.
2. It ensures ecological validity: The study was conducted in actual classroom settings, making findings more applicable to real-world educational contexts.
3. It allows for comparative analysis: The effectiveness of EYPAP could be contrasted with traditional methods to determine its impact on bilingual reading skills.

A quasi-experimental approach is consistent with previous studies on bilingual education that have examined instructional interventions using structured comparisons (Garcia, 2015; Lindholm-Leary, 2019). A multistage sampling technique was employed to select participants for this study. The study was conducted in six public primary schools across three local government areas in Ondo State:

- Ile Oluji/Oke Igbo
- Ondo East
- Ondo West

These locations were chosen based on their representation of diverse socio-economic and linguistic backgrounds. A total of 140 primary one pupils were selected, with 68 assigned to the experimental group (EYPAP) and 72 assigned to the control group (traditional method).

The criteria for sample selection included:

1. Pupils must be Yoruba native speakers to ensure the intervention was relevant to their linguistic context.
2. Pupils must be in primary one, as early literacy acquisition is a critical stage for bilingual reading development (Cummins, 2021).
3. Teachers in the experimental group must be trained in EYPAP to ensure accurate implementation of the instructional package.

Teachers were conveniently sampled, with 46 teachers participating across the selected schools. The teachers in the experimental group received training on using EYPAP, while those in the control group continued using traditional teaching methods.

Data Collection Using RSOCs and Pre-Test/Post-Test Analysis

Pre-Test and Post-Test Administration

A pre-test and post-test approach were implemented using the Reading Skill Observational Chart Scale (RSOCs) to measure the effectiveness of EYPAP. This observational tool assesses pupils' reading proficiency based on various linguistic and cognitive reading skills.

The pre-test was conducted before introducing EYPAP to determine pupils' initial reading abilities. After an eight-week intervention, the post-test was conducted to evaluate the changes in reading proficiency.

Reading Skill Observational Chart Scale (RSOCs)

The RSOCs was used as a standardized assessment tool to evaluate key reading skills, including:

- Vocabulary recognition
- Reading speed and accuracy
- Pronunciation and phonemic awareness
- Grammar and punctuation usage
- Comprehension skills

Each pupil was observed and rated on a four-point scale:

- Very Good (4 points)
- Good (3 points)
- Fair (2 points)
- Poor (1 point)

The RSOCs was administered twice (pre-test and post-test) to both groups. The same reading passages were used across the assessments to maintain consistency.

Implementation of EYPAP in the Experimental Group

The experimental group received structured instruction using EYPAP, which involved:

1. Alphabet comparison: Teaching Yoruba and English alphabets in parallel to highlight similarities and differences.
2. Phonetic exercises: Using sound-symbol association techniques to improve pronunciation and reading fluency.
3. Interactive reading activities: Encouraging paired reading and group discussions to reinforce comprehension.

The control group continued with traditional literacy instruction, which followed conventional teaching methods without explicit bilingual integration.

Data Analysis

Analysis of Covariance (ANCOVA) was employed to test the null hypothesis in this study at 0.05 level of significance

Results

This section presents the study's quantitative findings by comparing pre-test and post-test scores of the experimental (EYPAP) and control groups. The results are analysed using ANCOVA to determine the effectiveness of EYPAP in enhancing bilingual reading proficiency among primary one pupils in Ondo State.

To assess the initial reading proficiency of pupils before the intervention, a pre-test was

administered to the experimental (EYPAP) and control (traditional methods) groups. After the intervention, a post-test was conducted to evaluate improvements.

Table 1: Mean and Standard Deviation on Pre-Test and Post-Test Scores

Group	N	Pre-Test Mean (SD)	Post-Test Mean (SD)	Mean Gain Score
EYPAP	68	30.59 (1.32)	67.69 (1.49)	37.10
Control	72	30.50 (1.54)	59.26 (1.77)	28.76
Total	140	30.54 (1.43)	63.36 (4.53)	32.82

The result in Table 1 shown that pupils in the EYPAP group recorded a substantial increase in reading scores from 30.59 (SD = 1.32) in the pre-test to 67.69 (SD = 1.49) in the post-test. The control group also improved, but to a lesser extent, increasing from 30.50 (SD = 1.54) to 59.26 (SD = 1.77). The mean gain score (difference between post-test and pre-test scores) was higher in the EYPAP group (37.10) compared to the control group (28.76), indicating that the instructional package had a more substantial impact on reading proficiency.

ANCOVA Analysis: Effect of EYPAP on Bilingual Reading Proficiency

To determine whether the observed differences in reading proficiency were statistically significant, an Analysis of Covariance (ANCOVA) was conducted. Pre-test scores were controlled as a covariate to ensure any differences in post-test scores were due to the intervention rather than prior proficiency levels.

Hypothesis One: This states that there is no significant difference between the reading skills of pupils exposed to EYPAP and Conventional method

Table 2: ANCOVA Results for Post-Test Reading Scores

Source	Type III SS	df	Mean Square	F	Sig. (p-value)	Partial η^2
Corrected Model	2527.622	2	1263.811	530.264	0.000**	0.886
Intercept	805.946	1	805.946	338.155	0.000**	0.712
Pre-Test (Covariate)	43.980	1	43.980	18.453	0.000**	0.119
Treatment (EYPAP vs Control)	2460.879	1	2460.879	1032.524	0.000**	0.883
Error	326.521	137	2.383			
Total	564832.000	140				
Corrected Total	2854.143	139				

Table 2 revealed the results for post-test reading scores. EYPAP had a statistically significant effect on reading proficiency ($F(1, 137) = 1032.52, p < 0.001$). The partial eta squared value ($\eta^2 = 0.883$) indicates that the instructional method explained 88.3% of the variance in reading proficiency, confirming EYPAP's substantial impact. The pre-test scores had a minor but statistically significant influence on post-test outcomes ($F(1, 137) = 18.453, p < 0.001, \eta^2 = 0.119$), justifying ANCOVA's role in controlling for initial proficiency differences.

Effect of Gender on Bilingual Reading Proficiency

To examine whether EYPAP was equally effective for both male and female pupils, an independent t-test was conducted on post-test scores across gender.

Table 3: Post-Test Reading Scores by Gender

Gender	N	Post-Test Mean (SD)	Mean Gain Score
Male	52	63.04 (4.51)	32.39
Female	88	63.55 (4.56)	33.07
Total	140	63.36 (4.53)	32.82

Table 3 revealed the post-test reading scores by gender in which Male and female pupils showed similar post-test scores ($M = 63.04, SD = 4.51$ for males and $M = 63.55, SD = 4.56$ for females). The mean gain score was also similar across genders, indicating that EYPAP was equally effective for both male and female pupils.

Visual Representation of Findings

For further illustration of the impact of EYPAP, the mean pre-test and post-test scores for both

groups are plotted in the following bar chart:

Figure 1: Pre-Test vs. Post-Test Reading Scores by Group

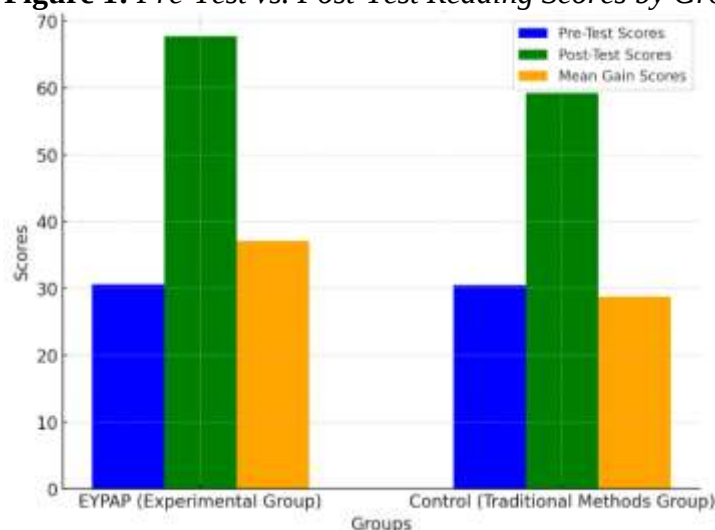


Figure 1 illustrated the result of pre-test and post-test reading scores by group in bar-chart. The post-test reading scores by gender showed similar post-test scores ($M = 63.04$, $SD = 4.51$ for males and $M = 63.55$, $SD = 4.56$ for females), indicating that EYPAP was equally effective for both male and female pupils.

Discussion

The results of this study provide strong empirical evidence supporting the effectiveness of the English-Yoruba Parallel-Alphabets Package (EYPAP) in enhancing bilingual reading proficiency among primary one pupils in Ondo State, Nigeria. The findings revealed a statistically significant improvement in the reading skills of pupils exposed to EYPAP compared to those instructed using conventional teaching methods. The statistical analysis using ANCOVA ($F(1, 137) = 1032.52$, $p < 0.001$, $\eta^2 = .883$) demonstrated that 88.3% of the variance in reading proficiency could be attributed to the instructional method, firmly rejecting the null hypothesis (H_0) and accepting the alternative hypothesis (H_1).

Bilingual education has long been recognised as a critical tool for promoting literacy and cognitive development in multilingual settings (Cummins, 2021). The effectiveness of EYPAP, as demonstrated in this study, aligns with research that emphasises mother tongue instruction as a foundation for second language acquisition (Garcia, 2015). The package provided a structured approach that leveraged similarities between Yoruba and English phonetics while addressing areas where linguistic interference commonly occurs.

The mean gain scores from the pre-test and post-test assessments further highlight EYPAP's impact. Pupils in the EYPAP group demonstrated a mean reading improvement of 37.10 points,

while those in the control group improved by only 28.76 points. This substantial difference suggests that EYPAP's structured bilingual approach helps bridge language learning gaps, particularly in phoneme recognition, pronunciation, and word decoding (Isaiah, 2023).

Additionally, teachers' observations confirmed that EYPAP enhanced classroom engagement, with pupils demonstrating greater confidence in Yoruba and English reading activities. This aligns with findings by Lindholm-Leary (2019), who noted that bilingual instructional strategies encourage active participation and cognitive flexibility.

The findings of this study align with previous bilingual education interventions that emphasize mother-tongue instruction as a stepping stone to second-language acquisition (Ogunyemi, 2023). Similar bilingual instructional models, such as transitional bilingual education

(TBE) and dual-language immersion programs, have shown significant gains in reading proficiency and linguistic retention (Lindholm-Leary, 2014).

However, unlike traditional bilingual models, which often phase out the mother tongue in favor of English, EYPAP employs a parallel-alphabet approach, ensuring continuous reinforcement of Yoruba alongside English literacy development. This method aligns with Contrastive Analysis Theory (CAT), which posits that learners benefit when explicitly addressing linguistic similarities and differences between their first and second language (Olawe, 2021).

While some bilingual programs have faced criticism for limited scalability due to resource constraints (Ricablanca, 2014), EYPAP offers a cost-effective, adaptable solution for multilingual educational settings. The findings suggest that policymakers should integrate EYPAP into the national curriculum to promote sustainable bilingual literacy development.

Conclusion

The hypothesis testing results confirm that EYPAP significantly enhances bilingual reading proficiency, providing statistically verifiable improvements in pupils' reading abilities. The null hypothesis (H₀) was rejected, which states that no significant difference exists between EYPAP and conventional methods. Instead, the study confirmed the alternative hypothesis (H₁), establishing that EYPAP significantly improves reading proficiency among primary one pupils in Ondo State.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Federal and State Ministries of Education, Curriculum Development Agencies (e.g., NERDC) and Universal Basic Education Commission (UBEC) should ensure the integration of EYPAP into National and State Literacy Curriculum for Education policymakers and curriculum designers' usage. This will be ensured by embed the EYPAP into the official Language Arts curriculum for Early Childhood and Lower Primary levels, align it with national language policy goals to promote mother-tongue-based bilingual instruction and organize workshops to train curriculum officers on EYPAP's structure and instructional strategy.
2. Nationwide Teacher Training on Bilingual Teaching with EYPAP in collaboration with Teacher Training Colleges, State Universal Basic Education Boards (SUBEB), NGO education partners should design and conduct structured in-service training programs and teacher workshops for Primary school teachers, teacher-trainers, and educational consultants to include EYPAP methodologies in pre-service teacher education courses, provide teaching aids, phonetic charts, and bilingual reading materials based on EYPAP.
3. Local Government Education Authorities, PTAs, donor agencies, publishing firms should make available, print and distribute EYPAP manuals, visual charts, and learners' workbooks in sufficient quantity to school heads, instructional material procurement officers, and community stakeholders. This can be effectively achieved through the use community funding and partnerships to support localized printing where central supply is delayed and also by monitoring the usage through lesson observation and reading assessments.
4. Parental Engagement in Early Bilingual Literacy Development by parents, caregivers, community leaders, school-based management committees. Conduct school-led sensitization meetings to show parents/guardians of children in early primary grades. How to use EYPAP-based charts or mobile tools at home. Encourage home reading sessions in both English and Yoruba using simple EYPAP-aligned materials. And also, through mobilizing local language advocates or volunteers to assist in home-based reading support.
5. Education research institutes, monitoring officers, school supervisors, NGOs should establish Monitoring and Evaluation Framework for Bilingual Literacy for educational quality assurance teams, and school inspectors. This can be ensured by developing EYPAP-specific indicators (e.g., rate of reading proficiency growth), track progress through bi-annual assessments using tools like the RSOCS and collect feedback from teachers and pupils to refine materials and approaches over

time.

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