

Evaluating the Effectiveness of Mother-Tongue Instruction on Literacy Retention among Adult Learners

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Abstract: This research investigated the influence of native language on the retention rates of literacy among adults at six public literacy centers in the Rivers South-East Senatorial District of Nigeria. Utilizing a quasi-experimental, ex post facto design with a non-equivalent groups methodology, the study analyzed a population of 2,378 adult learners from six local government areas: Khana, Gokana, Eleme, Tai, Oyigbo, and Opobo/Nkoro. The Taro Yamane formula determined a total sample of 342 learners, proportionally distributed between groups receiving instruction in their native language and those receiving instruction only in English. Data were collected using the Adult Literacy Retention Test Questionnaire (ALRTQ). Researchers evaluated literacy retention during post-test sessions and at 6- and 12-month follow-ups. Descriptive statistics, independent samples t-tests, repeated measures ANOVA, and ANCOVA were employed for data analysis at a significance level of 0.05. The results indicated that participants receiving instruction in their mother tongue had higher retention rates (82.6%) than those educated solely in English (54.4%). The independent t-test identified a notable difference in 12-month retention scores ($t(340) = 8.94, p < .001$). Repeated-measures ANOVA revealed significant time and instructional group effects, as well as a significant time-by-group interaction ($p < .001$). The ANCOVA results further confirmed that the language of instruction significantly predicted 12-month retention, even after controlling for age, gender, and educational history. The study concludes that instruction in a learner's native language significantly improves long-term literacy retention for adult students. The study suggests that adult literacy programs incorporate local languages into their teaching methods to support more sustained literacy gains.

Keywords: Literacy Retention; Adult Learners; Native Language; Educational History; Data Collection; Descriptive Statistics; Local Government Areas; Data Analysis.

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1. Introduction

Language is a fundamental tool in education, shaping how learners interpret, engage with, and remember information. In multilingual societies such as Nigeria, the most suitable instructional language has long been a major educational challenge. Over the years, researchers have highlighted that teaching students in their native language enhances understanding,

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engagement, and long-term retention of knowledge, especially in foundational literacy initiatives [4]. This happens because students can connect new information to their existing cultural and linguistic backgrounds, strengthening the significance and endurance of their learning experiences [2]. Research has consistently shown the advantages of mother tongue instruction in improving literacy outcomes. For example, studies on literacy progress in Nigeria show that adult learners and primary school students educated in local languages demonstrate stronger reading and writing skills than those taught solely in English, particularly in the early stages of learning [5]. Likewise, investigations in adult and non-formal education reveal that blending the mother tongue with English in literacy initiatives improves cognitive understanding and facilitates more effective acquisition of essential literacy skills among adult learners [3]. In Rivers State and similar multilingual areas, researchers assert that mother-tongue-based education fosters greater participation in adult literacy programs by making instruction more culturally relevant and accessible. These insights suggest that language choice significantly influences the effectiveness of adult literacy education [16].

Despite these advantages, a major obstacle persists in adult literacy centers across Nigeria, especially in the Rivers South-East Senatorial District. Many of these centers primarily use English for instruction, with minimal organized incorporation of learners' native languages [1]. This gap between classroom instruction and students' everyday linguistic environments often leads to reduced comprehension, lower engagement, and poorer retention of literacy skills [10]. Additionally, while mother-tongue instruction has been widely studied in primary education, substantial empirical research examining its effect on literacy retention among adult learners in adult literacy centers in this area remains limited [9]. This highlights a notable research gap, particularly given the distinct educational needs of adult learners, who rely heavily on prior knowledge and familiar language frameworks for learning [2]. Given this situation, the current study investigates how mother-tongue instruction affects literacy retention among adult learners in literacy centers in the Rivers South-East Senatorial District, Nigeria [15]. The study specifically aims to determine whether mother-tongue instruction improves learners' retention of reading, writing, and comprehension skills over time. It also seeks to evaluate the extent to which mother-tongue instruction contributes to continuous literacy growth compared with English-only instruction. The anticipated findings are expected to provide evidence to help policymakers, adult education facilitators, and curriculum designers create more effective and inclusive literacy programs that enhance learning outcomes for adult learners [17].

2. Methodology

The research employed an ex post facto design combined with a quasi-experimental framework. Because students were already enrolled in either "Native Language" or "English-only" literacy classes, randomization was unnecessary. The research adopts a non-equivalent groups design, with Group 1 comprising adult learners receiving literacy instruction in their native languages, such as Khana, Eleme, Opobo, and others. Meanwhile, Group 2 comprises adult learners educated exclusively in English. The study assessed retention rates after 6 to 12 months. This design evaluates cause-and-effect relationships without manipulation. The study's sample includes all adult learners from six public centers located in Rivers. The target population consists of adult learners aged 18 or older who are currently registered at public adult literacy centers within the Rivers South-East Senatorial District. This district comprises six local government areas: Khana, Gokana, Eleme, Tai, Oyigbo, and Opobo/Nkoro. The available population comprises all adult learners across these six public literacy centers, with one center in each local government area, for a total of six centers. According to Enrollment data for the 2024/2025 academic session, the total population is about 2,378 adult learners from six public adult literacy centers, as obtained from the Rivers State Ministry of Education. The study also employed multi-stage sampling. Stage one used purposive sampling to select 1 public adult literacy center in each LGA, for a total of 6 centers. Secondly, in stage two, stratified sampling was used to categorize learners by "language of instruction," such as native-language classes versus English classes. Similarly, for Stage three, simple random sampling was implemented using a ballot or lottery system to select learners from each class's roster. The calculated sample size using the Taro Yamane formula is about 342.4, rounded to 342 participants for practicality.

This sample will be divided proportionally between the two research groups: The Native Language instruction group and the English-only instruction group. Researchers will use an equal distribution method, assigning 171 students to the Native Language group and 171 to the English-only group. Additionally, participants will be allocated to selected learning centers to ensure each center has enough students to support meaningful statistical analysis and comparisons between groups. The instrument titled "Adult Literacy Retention Test Questionnaire (ALRTQ)," consisting of three parts, was used in the study. Part A: Demographic Information - Age, Gender, Local Government Area, First Language, Years of previous education, Job. Part B was the Language of Instruction, a 5-point Likert scale with 10 questions measuring the frequency of using the native language, teacher fluency, student understanding and comfort level. Example: "Lessons provided in my first language allow me to grasp literacy ideas more quickly" 1=SD to 5=SA. Similarly, Part C is the Literacy Retention Test- a criterion-referenced assessment based on UNESCO literacy standards: reading, writing, math. Reading: understanding of 10 brief texts in the native language/English. Writing: Dictation + sentence formation, 10 questions. Math: 10 fundamental arithmetic problems. Similarly, researchers conducted the test at 3 intervals: a post-test during graduation, a retention test at 6 months, and a retention test at 12 months. Scoring ranges from 0-30. Also, 3 specialists in Adult Education, Testing and Assessment, and Linguistics from

RSU assessed face and content validity. A pilot study was conducted with 30 participants outside the research area. Apply Cronbach's Alpha for Part B, targeting $\alpha \geq 0.7$. Apply K-R20 for Part C. The researcher will also obtain ethical consent and an introductory letter from the department, addressed to the Rivers State Ministry of Education and the six Local Government Area Education Authorities, for data collection.

Organize training for six research assistants, assigning one to each center, to oversee the administration of the training, which includes ethics, test execution, and scoring. For the baseline, collect demographic information and conduct a post-test right after graduation. For retention evaluations, monitor participants and re-administer only Section C after six months and again after twelve months. Utilize phone contacts and community mobilizers to minimize dropout rates. Repeat the evaluation with the items rearranged to reduce recall bias. The research data were evaluated using the mean, Standard Deviation, and Mean difference. Additionally, the hypotheses were assessed at the 0.05 significance level. The retention rate was calculated as: $\text{Retention Rate \%} = (\text{Number of learners who achieved } \geq 50\% \text{ at 12 months} / \text{Number of learners at post-test}) \times 100$. Independent t-tests compared the average retention scores of the native language group with those of the English group at 6 and 12 months. Repeated Measures ANOVA: Evaluating the influence of time points 0, 6 months, and 12 months alongside the language groups of native and English on retention scores. This assesses the "rate of forgetting." ANCOVA: Consider covariates such as age, previous schooling, and gender. The dependent variable is the 12-month retention score, the independent variable is the language group, and the covariate is the post-test score. Software used: SPSS. Report the effect size using Cohen's d. Ethical considerations include obtaining informed consent by detailing the study's purpose, ensuring voluntary participation, and informing participants of their right to withdraw. Confidentiality measures involve using codes instead of names. Test content is designed to align with learners' ability levels. The Rivers State Ministry of Education and the LGA education officer approved the study.

3. Results and Discussion

3.1. Demographic Characteristics of Respondents

This part outlines the demographic information of the participants based on the finalized analyzed sample ($n = 342$). The findings show that both groups had similar key demographic characteristics, thereby minimizing selection bias. Table 1 presents the demographic breakdown of participants ($n = 342$). The demographic information indicates that the research achieved balanced representation across the two instructional categories, thereby improving the comparability of the results. Within the Native Language group, 58 male participants (33.9%) and 113 female participants (66.1%) participated. In the English-only group, 62 male participants (36.3%) and 109 female participants (63.7%) participated. This indicates a slightly higher proportion of female respondents in both groups, suggesting that adult literacy engagement in the study region is primarily female-oriented. Regarding age distribution, most respondents were aged 36-50 years, comprising 82 (48.0%) from the Native Language group and 77 (45.0%) from the English group. This was followed by the 18 to 35 years and 36 to 49 years categories. This trend suggests that middle-aged individuals are most involved in adult literacy, likely driven by practical needs such as business and family responsibilities. Across the six Local Government Areas, respondents were distributed evenly, with each area providing approximately equal numbers of participants to both instructional groups. This consistent distribution strengthens the study's internal validity by minimizing location-related bias and ensuring that differences in literacy outcomes reflect the language of instruction rather than geographic factors.

Table 1: Demographic distribution of respondents ($n = 342$)

Variable	Category	Native language n (%)	English n (%)	Total n (%)
Gender	Male	58 (33.9)	62 (36.3)	120 (35.1)
	Female	113 (66.1)	109 (63.7)	222 (64.9)
Age	18–35	51 (29.8)	58 (33.9)	109 (31.9)
	36–50	82 (48.0)	77 (45.0)	159 (46.5)
	51+	38 (22.2)	36 (21.1)	74 (21.6)
LGA	Khana	29 (17.0)	29 (17.0)	58 (17.0)
	Gokana	29 (17.0)	29 (17.0)	58 (17.0)
	Eleme	29 (17.0)	29 (17.0)	58 (17.0)
	Tai	28 (16.4)	28 (16.4)	56 (16.4)
	Oyigbo	28 (16.4)	28 (16.4)	56 (16.4)
	Opobo/Nkoro	28 (16.4)	28 (16.4)	56 (16.4)

Table 1 presents an overview of the demographic profile of the 342 respondents who were included in the study in terms of gender, age and local government area (LGA). The sample was predominantly female (64.9%), while males comprised 35.1%.

The largest age group was 36–50 years (46.5%), followed by 18–35 years (31.9%) and 51 years and above (21.6%). Geographically, Khana, Gokana and Eleme provided 17.0% of respondents each, while Tai, Oyigbo and Opobo/Nkoro supplied 16.4% each. Overall, the distribution is fairly even across the selected LGAs, with females and middle-aged respondents making up the bulk of the sample.

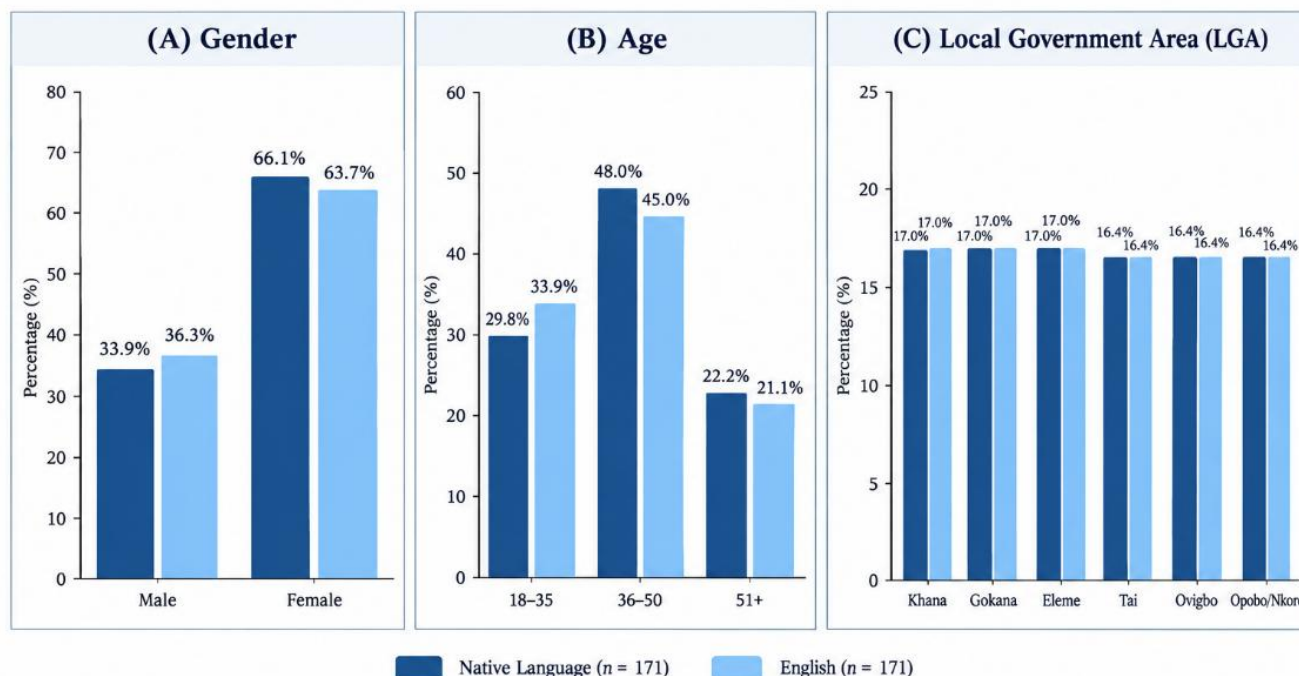


Figure 1: Demographic characteristics of respondents

Figure 1 shows the demographic information of the respondents in terms of gender, age and LGA. The two groups Native Language and English were quite comparable in terms of demographic characteristics. Table 1 presents the demographic profiles of the two groups. They appear to be comparable, ensuring equal representation and valid comparison between instructional categories.

3.2. Literacy Retention Rates and Performance Over Time

Research Question 1: What are the literacy retention rates for adult learners who receive instruction in their native language compared to adult English learners over time from six public schools in Rivers South-East Senatorial District?

Table 2: Literacy performance and retention over time

Group	Post-Test (Mean ± SD)	6-Month (Mean ± SD)	12-Month (Mean ± SD)	Retention Rate (%)
Native Language (n = 171)	24.32 ± 3.41	22.15 ± 3.87	20.84 ± 4.12	82.6
English Only (n = 171)	23.98 ± 3.55	19.42 ± 4.93	16.27 ± 5.31	54.4

Note: Retention is defined as the percentage of learners who achieve a score of $\geq 15/30$ at the 12-month mark.

Table 2 presents descriptive statistics for Literacy Performance and Retention Over Time. Literacy performance findings show a steady decline in scores for both groups over time, though the extent of this decline varies significantly between them. After the post-test, both groups exhibited relatively similar performance levels, with the Native Language group achieving a mean score of 24.32 ± 3.41 , compared to the English-only group's mean score of 23.98 ± 3.55 . This suggests that initial learning outcomes were similar immediately after instruction. However, at the 6-month follow-up, noticeable differences emerged. The Native Language group upheld a higher mean score of 22.15 ± 3.87 , while the English-only group's score fell more sharply to 19.42 ± 4.93 . This discrepancy was even more evident at the 12-month mark, when the Native Language group scored 20.84 ± 4.12 , compared with 16.27 ± 5.31 for the English-only group. The retention rates also support this trend. The Native Language group reached a retention rate of 82.6%, while the English-only group reached 54.4%. This indicates a significant retention

difference of 28.2 percentage points, reinforcing the idea that students taught in their native language are more likely to retain their literacy skills over the long term than those taught only in English.

3.3. Test of Hypotheses

Hypothesis 1: Literacy retention scores do not significantly differ between the Native Language group and the English-only group.

Table 3: Independent samples t-test

Group	n	Mean	SD	t	Df.	p	Cohen's d
Native Language	171	20.84	4.12	8.94	340	< .001	0.95
English Only	171	16.27	5.31	—	—	—	—

Table 3 presents the outcomes of the independent-samples t-test for 12-month literacy retention. An independent-samples t-test assessed whether literacy retention scores differed significantly at 12 months between the two educational groups. The findings illustrate that the Native Language group ($M = 20.84$, $SD = 4.12$, $n = 171$) had significantly superior performance compared to the English-only group ($M = 16.27$, $SD = 5.31$, $n = 171$), $t(340) = 8.94$, $p < .001$, with a large effect size (Cohen's $d = 0.95$). This result denotes a substantial and meaningful distinction between the two groups, both statistically and practically. The effect size suggests that instructional language is crucial for long-term retention of literacy skills. As a result of this finding, the null hypothesis, which posits that there is no notable difference in literacy retention scores between the two educational groups, is disproven. Therefore, learners educated in their native language have notably better retention of literacy skills than those instructed solely in English.

Hypothesis 2: There is no significant interaction effect involving time and instructional language on literacy retention scores.

Table 4: Repeated measures ANOVA

Source	SS	Df.	MS	F	p	η^2p
Time	2692.90	2	1346.45	186.42	< .001	.407
Group	1960.91	1	1960.91	62.17	< .001	.186
Time $\times$ Group	641.10	2	320.55	44.39	< .001	.146
Error (Time)	3927.63	680	5.78	—	—	—
Error (Group)	8579.26	340	25.23	—	—	—

Table 4 outlines the findings from the Repeated Measures ANOVA concerning Literacy Retention Over Time. A repeated-measures ANOVA evaluated how time, instructional group, and their interaction affected literacy retention scores. The results show a statistically significant main effect of time, $F(2, 680) = 186.42$, $p < .001$, $\eta^2p = .407$, indicating that literacy scores changed significantly across the three assessment periods. A notable main effect of group was also found, $F(1, 340) = 62.17$, $p < .001$, $\eta^2p = .186$, indicating that overall literacy performance varied significantly between the Native Language and English-only groups. Most critically, the interaction between time and instructional group was statistically significant, $F(2, 680) = 44.39$, $p < .001$, $\eta^2p = .146$. This finding suggests that the language of instruction influenced the pace of change in literacy scores over time. Specifically, students in the English-only group showed a more rapid decline in performance relative to their peers in the Native Language group. Based on these findings, researchers reject the null hypothesis that there is no significant interaction between time and language of instruction. The results indicate that instructional language significantly affects the pattern of literacy retention over time.

Hypothesis 3: The Language of instruction does not significantly forecast 12-month literacy retention when controlling for age, gender, and prior educational experiences.

Table 5: Analysis of covariance for 12-month literacy retention (Adjusted Sample Size)

Source	SS	Df.	MS	F	p	η^2p
Post-test Score	2303.19	1	2303.19	148.32	< .001	.356
Age	123.05	1	123.05	7.92	.005	.028
Gender	15.39	1	15.39	0.99	.321	.004
Prior Schooling	95.28	1	95.28	6.14	.014	.022
Group	515.84	1	515.84	33.21	< .001	.110

Error	4193.60	336	12.48	—	—	—
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Table 5 displays the findings from the Analysis of Covariance regarding 12-Month Literacy Retention. The ANCOVA tested whether the language of instruction significantly predicts literacy retention at 12 months, while controlling for post-test performance, age, gender, and prior educational experience. The findings indicate that the model was statistically significant, with the instructional group remaining a strong predictor of literacy retention, $F(1, 336) = 33.21$, $p < .001$, $\eta^2p = .110$. Among the covariates examined, the post-test score was the most influential factor for retention after 12 months, $F(1, 336) = 148.32$, $p < .001$, $\eta^2p = .356$, indicating that initial literacy success significantly affects long-term retention. Age also had a notable but less pronounced effect, $F(1, 336) = 7.92$, $p = .005$, $\eta^2p = .028$, indicating that older students perform slightly differently in retention than their younger counterparts. Experience from prior schooling also showed significance, $F(1, 336) = 6.14$, $p = .014$, $\eta^2p = .022$, while gender did not display statistical significance, $F(1, 336) = 0.99$, $p = .321$, $\eta^2p = .004$. Based on these findings, researchers reject the null hypothesis. The results indicate that instructional language significantly influences literacy retention after 12 months, even after controlling for relevant demographic and educational variables. This insight confirms that the language of instruction has a distinct and substantial influence on long-term literacy outcomes, independent of specific learner traits.

4. Discussion of the Findings

Table 1 presents the outcomes regarding the Demographic Distribution of Respondents. It indicates that the two instructional groups were largely similar, with comparable gender ratios and balanced representation from various locations, thereby enhancing internal validity. The higher percentage of female respondents aligns with findings from adult literacy studies showing that women generally have higher participation than men in enrollment, attendance, engagement, and completion [11]. This trend also aligns with broader observations of women's significant involvement in adult literacy initiatives in Nigeria, despite familial and economic challenges [16]. The prevalence of respondents in the 36–50 age range aligns with previous research indicating that adult literacy initiatives cater to a range of learners, often shaped by life stage, underscoring the importance of age-relevance in participation and engagement [12]; [15]. The balanced representation across the six LGAs is methodologically significant, as contextual variations could affect participation and outcomes in adult literacy; thus, reducing geographical bias increases confidence that later score variations reflect instructional language rather than location. Table 2 presents the descriptive statistics on literacy performance and Retention Over Time. This shows that both groups declined after the post-test, but the Native Language group decreased slightly and retained significantly more skills after 12 months. This trend aligns with research showing that instruction in one's mother tongue improves literacy outcomes, including reading proficiency and comprehension [10]. It also parallels findings in Ghana, where students who continue learning in their initial language outperform those who switch to another language, particularly English [6].

The substantial retention difference in favor of native-language instruction reflects broader evidence that first-language literacy foundations bolster enduring reading skills [9]. However, the decline observed in both groups is not unexpected, as progress in adult literacy often diminishes over time, and a regression into low literacy remains a recognized challenge within adult literacy programs [5]. Table 3 presents the results of the Independent-Samples t-test for 12-month literacy retention. The findings indicate a statistically significant and considerable gap between the groups, with the Native Language group significantly outperforming the English-only group at the 12-month mark. This aligns with experimental data from Kenya, which found that literacy instruction in one's native language yields stronger outcomes than instruction in another language, with effect sizes of 0.3–0.6 SD for mother-tongue literacy achievement [17]. Furthermore, it aligns with a systematic review from Ethiopia that reported improvements in literacy, reading skills, and comprehension through native-language instruction. However, earlier research indicates that the quality of its execution influences the level of benefit from this approach. In Kenya, mother-tongue education initiatives faced challenges, including mismatches between teachers' language proficiency and community resistance, as well as diverse language environments. Similarly, evidence from South Africa indicates that teachers struggle with translation issues and are inadequately prepared to teach in the mother tongue, even though the approach benefits educational outcomes [7]. Table 4 presents the findings from the Repeated Measures ANOVA regarding Literacy Retention Over Time. This reveals three key findings: a temporal effect, a group effect, and a notable time-by-group interaction. The temporal effect suggests that literacy scores fluctuated across measurement intervals, aligning with educational research indicating that retention diminishes without reinforcement, whereas ongoing exposure enhances consolidation and recall.

The group effect corroborates existing literature indicating that teaching in a native language generally improves literacy outcomes [10]. The interaction effect is particularly noteworthy, as it shows that the language of instruction influenced the rate of literacy decline. This aligns closely with findings from Ghana that disruptions between a child's initial Language of instruction and the Language used in subsequent education negatively impact literacy development, with children moving to English not keeping pace with those advancing to another local language [6]. Table 5 displays the results of the Analysis of Covariance for Literacy Retention after 12 Months. This shows that the language of instruction remained a crucial predictor even after accounting for post-test scores, age, gender, and prior educational experiences. This reinforces the assertion that the

medium of instruction independently influences long-term retention. The finding that post-test score was the most significant covariate aligns with research indicating that post-test performance better predicts future retention than score gains alone [8]. This also aligns with broader longitudinal studies showing that prior achievement is the primary predictor of future success, while demographic and contextual factors contribute less [14]. The notable influence of previous educational experience is also reasonable, given broader research indicating that background factors affect later achievement, even when earlier performance is the main factor [13]. Conversely, the lack of a significant impact of gender implies that gender may influence participation rates more than retention, which aligns with studies on adult literacy indicating that although females enroll at higher rates, there is no clear evidence that gender alone determines later success in literacy performance [12].

5. Conclusion

The research concludes that instructional language choice is essential and statistically significant for adult literacy retention. Specifically, learners who received instruction in their native languages showed consistently higher retention rates and a slower decline in literacy skills over time than those instructed only in English. The findings also indicate that the benefits of mother-tongue instruction are both immediate and long-lasting, as evidenced by 6-month and 12-month evaluations. The significant interaction effect between time and instructional group suggests that learners in English-only programs experience a more rapid decline in literacy skills. Furthermore, while prior educational history and age play a role in retention outcomes, the language of instruction is a stronger, independent indicator of ongoing literacy success. Gender did not significantly affect literacy retention. The findings support the assertion that mother-tongue instruction is more effective in maintaining literacy among adult learners in the Rivers South-East Senatorial District.

5.1. Recommendations

Considering the findings, the following suggestions are offered:

- Adult literacy programs in Rivers State should integrate indigenous languages, such as Khana, Eleme, Opobo, and others, as the primary medium of instruction to promote long-term literacy retention.
- The Ministry of Education in Rivers State should formulate and implement policies that facilitate bilingual or mother-tongue-based adult literacy education throughout all public literacy centers.
- Literacy educators should be trained in multilingual teaching strategies to teach effectively in both English and their native languages.
- Curriculum developers should create and distribute educational materials in local languages to ensure uniformity and high teaching standards.
- Efforts should be made to run promotional initiatives that foster the acceptance of teaching in one's native language and enhance involvement, particularly among adult male students.

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