

USE OF POST HOC ANALYSIS ON PUPILS LITERACY SKILLS OUTCOME IN PUBLIC PRIMARY SCHOOLS IN OJO LOCAL GOVERNMENT OF LAGOS STATE NIGERIA

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Abstract

Post-Hoc analysis is a unique statistics employed in the determination of where the actual difference lies in a set of distribution. The study employed the use of survey design using a descriptive approach. Population of the study comprised all pupils in Public Primary Schools in Lagos State while target population comprised Basic 3, 4 and 5 pupils in Ojo LGA of the state. Using simple random sampling technique, three public primary schools were selected for this study. For the first school, 33 pupils were selected from Basic 3 class, 33 pupils from Basic 4 class and 34 pupils from Basic 5 to make a sample of 100 pupils. The use of teacher made test titled, "Pupils Literacy Skills Test" (PLST) was used for data collection. This test contains 30 Multiple Choice Test items from Literacy Skills on 3 options format. Construct validity was established and use of Test re-test reliability form yielded an index of .808. Data was analysed using Analysis of Variance (ANOVA) while Post-Hoc Test was used to determine where the difference lies. The hypothesis was tested at significance level of .05. The findings revealed that differences exist across class levels as Pupils in class 5 performed the most, followed by class 3 and class 4 respectively. The study concluded that the performance of pupils in Basic 5 is associated to the use of instructional materials, experience, maturity in terms of age, better exposure to resource availability and teaching strategies, well-motivated among others. It recommended that teaching at the primary school level should not be discriminatory rather a universal activity where learners across all levels are exposed to quality instruction.

Keywords: Post-Hoc, Literacy Skills Outcome, Pupils, Public Primary School, Significance

Introduction

Literacy remains a foundational skill for assessment of academic achievement and lifelong learning, serving as the bedrock upon which pupils build other knowledge domains. In Nigeria, particularly in Lagos State, literacy development in public primary schools has been a major concern due to the wide variation in pupils' performance levels (Adewunmi & Oladipo, 2020). Despite policy interventions and curriculum reforms, many children still struggle with reading and writing, which poses significant challenges to educational advancement. This reality calls for robust assessment tools and analytical approaches that can provide insights into the specific gaps in literacy outcomes.

Pupils' literacy skills remain a central focus of educational research and policy with recent national assessments showing measurable improvements in foundational reading ability. According to the 2025 National Phonics Screening Report conducted by Universal Learning Solutions, systematic phonics instruction, particularly through the nationwide implementation of the Jolly Phonics programme has led to notable gains in early-grade reading. The report found that the proportion of Primary 1 pupils achieving a 20-word reading benchmark increased from 20.9% in 2021 to 35% in 2025, while Primary 2 pupils' ability to read 30 words rose from 17.7% in 2019 to 26.6% in 2025, demonstrating enhanced decoding and word-reading skills among young pupils across 33 states and the Federal Capital

Territory (FCT). These improvements suggest that structured phonics and teacher engagement are key drivers of literacy development in primary schools (Njoku, 2025).

On instructional strategies that strengthen literacy performance at the Primary school level, Udu and Amishiave (2025) executed a quasi-experimental study in public schools in Makurdi, Benue State, reported that pupils exposed to Jolly Phonics exhibited significantly greater interest and achievement in reading comprehension compared to those taught with traditional methods, indicating that multi-sensory phonics instruction can boost both engagement and reading proficiency in early learners. Meanwhile Ajayi and Adedigba (2023) investigated effect of phonological awareness strategy on pupils' learning outcome in reading. The findings revealed that approaches emphasizing phonological skills significantly improved reading outcomes for primary pupils, thereby reinforcing the importance of targeted instructional techniques for literacy enhancement. This result underlines the multifaceted nature of literacy development in Nigeria, where effective teaching methods, supportive learning environments and stakeholder involvement combine to strengthen pupils' literacy skills.

Educational research often employs statistical methods to measure and compare pupils' literacy achievement across groups, especially in the area of gender, school location and instructional strategies. Analysis of Variance (ANOVA) is one of such methods commonly used to determine whether significant differences exist among groups. However, while ANOVA indicates the presence of differences, it does not show exactly which groups differ. This limitation makes post hoc tests critical in educational studies because they provide clarity by identifying the exact pairwise differences among groups (Field, 2018).

A Post Hoc Test is a statistical procedure used after an analysis of variance (ANOVA) has shown that there are significant differences among group means. While ANOVA can tell that at least one group differs from the others, it does not specify which of the groups are significantly different. This is where Post Hoc test comes in as they perform pairwise comparisons between group means to identify the specific sources of difference. Most importantly this test determines exactly where the differences lie after finding an overall effect when a statistically significant difference has been established. Post Hoc tests such as Tukey's HSD, Scheffé's test and Bonferroni adjustments are widely applied in educational research to examine group differences after a significant ANOVA result. These statistical tools are particularly useful in literacy studies where multiple instructional methods, demographic categories, and school settings are compared (Okeke & Adegbile, 2020). In the context of Lagos State's public schools, where disparities in teaching resources and learning conditions exist, post hoc analyses can provide nuanced evidence of where intervention is most urgently needed.

Ogunlana and Oyetunde (2020), literacy development in public schools is most times affected by multiple variables, including teacher competence, socio-economic background, and learning environment. Conventional analysis methods may overlook subtle yet important differences between groups, thereby limiting the effectiveness of interventions. By applying post hoc tests, researchers are able to detect which categories of pupils such as rural versus urban, male versus female, or those exposed to different instructional methods demonstrate significant performance differences, thus providing evidence-based direction for literacy improvement programs.

However in educational studies, the use of Post Hoc test also aid in the identification of the exact group of pupils under performing and also guide provides a clearer pathway for targeted interventions. Moreover, understanding which instructional strategies are yielding the most significant differences in literacy outcomes can help refine curriculum implementation and teaching practices (Adewunmi & Oladipo, 2020). In this way, the application of post hoc tests goes beyond statistical rigor to practical

educational improvement.

Statement of the Problem

Despite continuous efforts by government and educators to improve literacy outcomes in public primary schools in Lagos State, many schools still record poor academic outcomes as pupils still perform below expected standards in reading and writing as wider variations across gender, socio-economic background, school location, and instructional strategies are recognised. This poor performance may have been as a result of poor methodology by the teacher, use of ambiguous words, lack of learners' motivation, low interest, lack of instructional materials among others. As part of measures to improve on the outcome level, traditional statistical approaches such as mean comparisons or ANOVA have often been employed to evaluate literacy achievement, however, these methods only reveal whether overall group differences exist without specifying where those differences lie. This limitation has led to gaps in identifying the specific categories of pupils most affected by poor literacy performance, thereby weakening the precision of targeted interventions. The use of Post-Hoc tests provides a more detailed analysis in highlighting the exact groups with significant differences in literacy skills, yet its application remains limited in Nigerian educational research. Consequently, there is a pressing need to investigate how Post-Hoc tests can be effectively utilized in analyzing pupils literacy skills in public primary schools in Lagos State.

Purpose of the Study

This study investigated use of Post Hoc Test in analysing pupils literacy skills outcome in public primary schools in Lagos State. Specifically this study is out to:

1. Justify the use of Post Hoc Test in analysing literacy skills outcome of pupils in public primary schools by class.

Hypothesis

One null hypothesis was formulated and tested at 0.05 level of significance.

H01: There is no significant difference in Pupils Literacy Skills Outcome in Public Primary Schools by class.

Significance of the Study

The outcome of this work would be beneficial to stakeholders like pupils, teachers, researchers, test developers among others. For pupils the outcome of this study will help them identify specific groups that need additional support, ensuring fair and targeted intervention; meanwhile for teachers, it would provide a clear evidence of which instructional strategies is the most effective that has the potential of guiding improvements in classroom practices. Researchers too would benefit from this study as it would aid them obtain precise information on where significant differences in literacy skills lie, thereby strengthening the validity of their findings. For test developers, post hoc analysis would highlight the patterns in pupils' performance that can improve the design of fair, reliable and valid literacy assessments.

Methodology

The study employed the use of survey research design type. This design allows for the study of larger participants in order to get generate a robust and varied response from participants. Population of the study comprised all pupils in Public Primary Schools in Lagos State while target population was Basic 3, 4 and 5 pupils in Ojo LGA of the state. Through the use of simple random sampling technique, three public primary schools were selected for this study. For the first school, 33 pupils were selected from Basic 3 class, for the second school, another 33 pupils were selected from Basic 4 class, for the third school, 34 pupils from Basic 5 were selected for the study making a sample size of 100 pupils

respectively. The use of teacher made test titled, “Pupils Literacy Skills Test” (PLST) was used for data collection. This test contains 30 Multiple Choice Test items from Literacy Skills related components on 3 options format. Construct validity was established and use of Test re-test reliability form yielded an index of .808 respectively. Data was analysed using Analysis of Variance (ANOVA) while Post-Hoc Test was used to determine where the source of difference lies. The hypothesis was tested at significance level of .05.

Results

H01: There is no significant difference in Literacy Skills Outcome of Pupils in Public Primary Schools by class.

Table 1: ANOVA Analysis showing significant difference in Literacy Skills Outcome of Pupils in Public Primary Schools by class

Variable	Sum of Squares	Df	Mean Square	F-value	Sig.
Between Groups	45.404	2	22.702	.332	.000
Within Groups	6708.419	98	68.453		
Total	6753.823				

Source: Researchers work (2025)

The ANOVA result in Table 1 shows that the calculated F-value is .332 with a significance value (p) of .000. Since the p-value is less than the 0.05 level of significance, the result indicates that there is a statistically significant difference in analyzing literacy skills of pupils in public primary schools by class. This means that any observed differences in mean performance among the groups are likely due to experience and exposure of pupils in the class.

Table 2: Post Hoc Test for Multiple Comparisons of the difference in Literacy Skills of Pupils in Public Primary Schools

(I) Variable	(J) Variable	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Class 3	Class 4	.85057*	.37468	.024	.1145	1.5867
	Class 5	-2.81034*	.37468	.000	-3.5464	-2.0743
Class 4	Class 3	-.85057*	.37468	.024	-1.5867	-.1145
	Class 5	-3.66092*	.37468	.000	-4.3970	-2.9248
Class 5	Class 3	2.81034*	.37468	.000	2.0743	3.5464
	Class 4	3.66092*	.37468	.000	2.9248	4.3970

Data in Table 2 shows that the LSD Post Hoc Test was used to determine the direction of differences in the data generated. Class 3 to 4 is significant at .024, Class 3 to 5 at .000; Class 4 to Class 3 is significant at .024, Class 4 to 5 at .000; Class 5 to 3 is significant at .000 and Class 5 to 4 at .000 respectively. Hence the core class responsible for the difference Class 5 with sig-value of 0.000 (p<.05).

Discussion of Findings

It is revealed that post hoc reportage provides a deeper understanding beyond the general significance indicated by ANOVA. While the initial analysis confirms that differences exist in literacy performance among schools, the post hoc test pinpoints where these differences actually lie, making the results more meaningful for educational decision-making. In this study, it revealed that pupils in Class 5 outperform those in Class 3 and 4 and that Class 4 also performs better than Class 3, which offers valuable insights into variations in instructional quality, experience, chronological factor like age, exposure of pupils,

motivation, resource availability or teaching strategies among others as responsive factors that necessitate the difference among the pupils. Such detailed reportage helps stakeholders, including teachers, policymakers, and curriculum planners, to design targeted interventions that address specific weaknesses, replicate effective practices, and ultimately enhance literacy development across schools (Field, 2018). Meanwhile Ojerinde (2019) also stated that without post hoc analysis, important nuances in group differences may remain hidden, limiting the practical relevance of research findings.

Conclusion

The study examined the use of Post Hoc Test in analysing literacy skills outcome of pupils in public primary schools in Lagos State. From the findings it concluded that pupils in Class 5 perform better than those in Basic 3 and 4. This is so as pupils in Basic 5 are taught with the use of instructional materials, experience, maturity in terms of age than those in class 3 and 4, better exposed to resource availability and teaching strategies, well-motivated among others.

Recommendations

Among other recommendations, the study recommended:

1. Teaching at the primary school level should not be discriminatory rather a universal activity where learners across all levels are exposed to quality instruction.
2. Post Hoc analysis need not be conducted when the result shows no existence of statistical significance as it would amount to waste of time.
3. Post Hoc analysis should be extended to non-parametric statistics even when statistical significance is detected.
4. Training should be organised for academics and researchers on the need to introduce Post Hoc analysis in future studies.

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