

Responsive Pedagogy and Functional Literacy: Enhancing Numeracy Outcomes for Internally Displaced Children

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Abstract: *The study addressed how the use of responsive and functional literacy pedagogy to enhance numeracy outcome for internally displaced children in Benue and Plateau States, Nigeria. Employing quasi experimental designs, the target population for this study consisted of approximately 713 internally displaced children residing in selected IDP camps in Benue and Plateau States, Nigeria. The available sample for the study was 488 pupils (male = 274 and female = 214). To ensure a representative sample, the researchers employed both purposive and stratified random sampling, accounting for variations in gender, and level in primary school (grades 4 and 5). However, all pupils in the 3 schools and 6 schools from Plateau and Benue States were respectively used as intact classes being a characteristic of quasi experimental study where full randomisation was not possible. Numeracy Ability Tests (NAT) with reliability index of 0.84 was deployed in data collection. Results show that there is significant difference in the mean numeracy outcome of internally displaced children taught numeracy using responsive and functional literacy pedagogy and those taught using conventional strategy; $F(1,485) = 39.786$; $p = 0.000 < 0.05$]; there is significant difference in the mean numeracy outcome of internally displaced male and female children taught numeracy using responsive and functional literacy pedagogy; $F(1,212) = 4.607$; $p = 0.033 < 0.05$]. It was recommended among others that teachers, school administrators, curriculum designers should integrate responsive and functional literacy pedagogy that focus on the functional application of literacy skills in real-world contexts in the curriculum for the displaced children. Education policymakers should provide*

emergency education curriculum with a clear framework on the use of responsive and functional literacy pedagogy to tailor their approaches to meet the pedagogic needs of the displaced populations.

Keywords: responsive pedagogy, functional literacy, numeracy outcomes, internally displaced children, mathematics, mathematics achievement.

INTRODUCTION

Years of ethno-religious conflict, farmer-herder disputes, and armed banditry in Plateau and Benue States have led to a serious humanitarian crisis characterized by the displacement of many people from their ancestral lands. This situation has serious consequences for children, who are often the most vulnerable in such crises. Consequently, the educational landscape in these two states has remained severely disrupted, with many schools destroyed, repurposed as shelters for internally displaced families, or rendered inaccessible due to violence and other forms of insecurity, leading to substantial educational gaps for children. Internally displaced children are especially vulnerable, struggling with legacies of violence such as psychological trauma, loss of family support, and inadequate access to education. These challenges contribute significantly to a cycle of poverty, as many children lack the necessary skills for stable employment and community development. By way of addressing these challenges, therefore, this study explored responsive pedagogy and functional literacy instruction specifically tailored to respond to the unique needs of internally displaced children.

This research framework focuses on the idea that people aren't just passive "buckets" to be filled with information; instead, they actively build their own understanding. From the theories of Piaget and Vygotsky, it is highlighting two specific pillars: individual experience, that learners connect new information to what they already know, and social interaction, that learning is faster and deeper when people talk, collaborate, and solve problems together rather than working in isolation.

Constructivist theory aligns closely with the principles of responsive pedagogy, which advocates for adapting teaching strategies to meet the unique backgrounds and experiences of students, particularly those from marginalized communities. This alignment is crucial for effectively addressing the challenges faced by internally displaced children in Benue and Plateau States, who often come from traumatic backgrounds and require educational practices that recognize and validate their experiences.

Responsive pedagogy emphasizes the necessity of educators being attuned to the emotional and psychological states of their students. In contexts where trauma is prevalent, such as among internally displaced populations, understanding students' backgrounds is vital for creating safe and supportive learning environments. By employing strategies that acknowledge the lived experiences of these children, educators can help mitigate the effects of trauma, thereby enhancing both emotional well-being and academic performance. Responsive pedagogy is a vital, student-centered approach for learners facing trauma or displacement, improving engagement and learning outcomes by tailoring education to individual emotional, psychological, and academic needs. It fosters inclusive environments by integrating students' backgrounds, promoting emotional safety, and reducing the risks of re-traumatization. This implies that addressing trauma internally displaced populations in Nigeria (Benue and Plateau), is crucial to address the severe emotional and psychological needs stemming from violence. There would be need for differentiated Instruction by drawing on Tomlinson

(2014), responsive pedagogy that emphasizes tailored instruction to match student readiness, interests, and learning profiles. Also, supportive environments as noted by Miller (2019), implies knowing that the students' background is essential to creating a supportive learning space. Essential components would imply effective implementation that requires recognizing cultural backgrounds, building positive relationships, and adapting instruction, which fosters belonging and academic success. In short, responsive pedagogy transforms classrooms from rigid structures into supportive, safe spaces that recognize the whole child, enhancing both educational and psychological well-being.

According to UNESCO (2025), functional literacy is a crucial driver of socioeconomic development, significantly impacting employment opportunities and overall quality of life. Research indicates that functional literacy is particularly vital for marginalized populations, including internally displaced children in Nigeria. Studies have shown that children who acquire functional literacy skills are better equipped to reintegrate into their communities and contribute positively to society (World Bank, 2018). Furthermore, functional literacy has been linked to improved health outcomes, civic engagement, and social cohesion, making it an essential component of educational programs in crisis-affected areas.

The intersection of responsive pedagogy and functional numeracy emerges as a critical area for addressing the unique challenges faced by internally displaced children in Benue and Plateau States. Winthrop and McGivney (2013) argue that integrating responsive teaching practices into functional literacy programs can lead to more effective learning experiences. This integration allows educators to create curricula that not only build literacy skills but also resonate with students' lived experiences, making learning more relevant and meaningful. Programs incorporating culturally relevant materials and community-based learning can help students connect their education to their real-life contexts, thus enhancing motivation and learning outcomes (Gonzalez *et al*, 2005).

Despite the recognition of both responsive pedagogy and functional literacy/numeracy as essential components of effective education, many educational policies in Nigeria remain rigid and standardized. Recent initiatives, such as the Nigerian National Policy on Education, have begun to acknowledge the importance of inclusive and responsive educational practices. However, significant gaps still exist between policy and practice, particularly in regions affected by conflict and displacement (Osokoya, 2019). This research aims to bridge this gap by providing evidence-based recommendations for integrating responsive pedagogy and functional literacy into educational programs for internally displaced children, ultimately contributing to their resilience and socioeconomic empowerment in the face of adversity.

By combining responsive pedagogy, which transforms teaching methods to accommodate diverse backgrounds, with functional literacy/numeracy that provides essential skills, this research aims to improve numeracy outcome and empower these children to escape or break the vicious cycle of mathematics knowledge poverty. The findings are expected to offer valuable insights on effective educational strategies that promote resilience and social cohesion among internally displaced children in Nigeria.

Research Objectives

The following research objectives helped to shape this study:

1. document the unique learning needs of Internally Displaced Children

2. assess impact of responsive and functional literacy pedagogy on learning outcomes (numeracy) of the Internally Displaced Children

Research Questions

The following research questions guided this study:

1. Document the unique learning needs of Internally Displaced Children
2. What are impacts of responsive and functional literacy pedagogy on learning outcomes (numeracy) of the Internally Displaced Children?

LITERATURE REVIEW

Internally displaced children (IDC) navigate compounding educational barriers, including poverty, insecurity, trauma, and cultural or linguistic disconnections. According to UNICEF (2023), these disruptions cause significant disparities in both social development and academic preparedness. To counter this, educational systems must prioritize flexibility and inclusivity through catch-up learning and psychosocial support.

Regionally, the Internal Displacement Monitoring Centre (IDMC, 2023) notes that Nigeria manages one of the most substantial displaced populations in Africa, with high concentrations in Plateau and Benue States. In these regions, displaced youth frequently struggle with inadequate school infrastructure, a shortage of qualified teachers, and limited access to standard education.

To meet these multifaceted challenges, targeted pedagogical strategies are required. Additionally, UNICEF (2022) emphasizes the necessity of safe learning environments, mobile education, and accelerated learning programs. These specialized interventions should aim to improve both cognitive and non-cognitive outcomes, fostering adaptability, self-efficacy, and overall well-being

Responsive pedagogy adapts instruction to learners' social, emotional, and cultural realities. In conflict zones like Nigeria's Benue and Plateau States, traditional teaching often falls short for displaced children. Research confirms that trauma-informed, culturally relevant, and learner-centred responsive teaching is vital (Burde et al., 2019; INEE, 2022). Effective emergency education prioritises psychological safety, community integration, and differentiated instruction. As highlighted by INEE, adapting to trauma and disrupted schooling boosts resilience and learning outcomes. Furthermore, Winthrop and Barton (2018) stress that flexible, localized education supports psychosocial recovery, helping students re-engage with learning and allowing schools to act as stabilizing forces during displacement.

Functional numeracy is the ability to use basic mathematical skills—such as counting, calculating, and interpreting data—to navigate and solve everyday problems. It focuses on practical, real-world application rather than advanced theory, empowering individuals to live independently, manage finances, and fully participate in society (UNESCO, 2017). Core components of functional numeracy include:

- Basic Operations: Using addition, subtraction, multiplication, and division to balance budgets, manage currency, and calculate change.

- Measurement: Reading and converting units of length, weight, volume, and temperature for cooking, construction, or travel.
- Time Management: Reading analog and digital clocks, calculating durations, and creating daily schedules or travel itineraries.
- Data Interpretation: Understanding basic percentages, simple fractions, and charts often seen in news reports, bills, or medical information.
- Estimation: Quickly approximating numbers to check if a result makes practical sense (e.g., verifying a receipt total).

Organizations like [National Numeracy](#) emphasize that functional numeracy is about both possessing these essential skills and having the confidence to apply them to thrive at work and in daily life (UNESCO, 2017).

Functional numeracy is the ability to understand, apply, and reason with numerical concepts in real-world contexts. It bridges abstract mathematics and everyday problem-solving. Psychologically, it relies on cognitive flexibility, decision-making biases, and dual-process reasoning. Philosophically, it raises questions about the ontology of numbers and the ethics of quantitative literacy. The cognitive psychology of functional numeracy goes beyond rote memorization; it emphasizes how the human brain represents and manipulates quantities in dynamic environments.

Dual-Process Theory: Human numeracy operates on two distinct systems. *System 1* is intuitive, fast, and driven by affect (e.g., estimating if a bill is roughly correct). *System 2* is deliberate, rule-based, and analytical (e.g., precisely calculating an interest rate).

Fuzzy-Trace Theory (Valerie & Charles, 1995): When interpreting statistics or risks in everyday life (such as medical or financial data), the mind prefers processing simple "gist" representations over exact, verbatim numbers. Individuals highly adept at functional numeracy intuitively form these meaningful gists without getting bogged down in unnecessary details.

Constructivism: Foundational to numeracy education, constructivism argues that mathematical knowledge is not passively received but actively built by the learner through experiences. In this view, functional numeracy is a continually evolving mental model rather than a set of discovered, Platonic truths.

The implementation of responsive pedagogy and functional numeracy has gained empirical support as an effective strategy for improving the educational experiences of internally displaced children (IDCs), especially within conflict-affected regions such as Benue and Plateau States in Nigeria. A growing body of literature highlights the importance of tailoring numeracy instruction to reflect learners' contexts, cognitive levels, and socio-emotional needs. Yusuf, Mohammed, and Adamu (2020), in their evaluation of functional literacy/numeracy programmes for internally displaced adults in Bauchi State, found that adapting curriculum content to everyday experiences enhanced learner engagement and outcomes. However, they also observed that the lack of baseline diagnostic assessments hindered the effectiveness of instruction. These findings emphasise the necessity of embedding learner assessments in literacy interventions to identify specific academic and psychosocial needs—especially in fragile settings where displacement disrupts learning continuity.

One of the most prominent contemporary examples of responsive pedagogy in practice is the *FastTrack Accelerated Learning Programme*, developed by the Aid for Rural Education Access Initiative (AREAi). This programme integrates teaching-at-the-right-level (TaRL) methods, bilingual (mother-tongue) instruction, and low-tech digital tools such as the Mavis Talking Pen. In six IDP camps, literacy and numeracy scores improved significantly within just 24 days—from 7.4% to 31.6% and 4.8% to 17.7%, respectively (AREAi, 2022). The scalability of this model is demonstrated by its expansion to over 25,000 children across ten IDP and refugee camps by 2024 (AREAi, 2023; WISE, 2024). According to AREAi, the combined use of TaRL, mother-tongue instruction, and low-tech learning tools produced results that were three times more effective than interventions employing isolated methods.

Beyond basic educational gains, functional literacy and numeracy programs are linked to better socio-economic futures for displaced populations. For instance, adult internally displaced persons (IDPs) in Bauchi State showed increased self-reliance and better entrepreneurial skills after participating in livelihood and literacy training (Yusuf et al., 2020). Similarly, functional literacy strengthens economic independence by raising productivity, increasing income potential, and easing access to essential services like healthcare (Njoku & Nnadi, 2021). However, in Kano State, Isa (2018) noted that although adult learners achieved economic empowerment, severe infrastructural deficits—such as a lack of learning materials and insufficient classroom space—presented major obstacles. These insights are highly valuable for child-centric programs, which seek to build resilience, promote well-being, and ensure successful socio-economic integration alongside teaching numeracy.

The FastTrack programme and its partnership with TheirWorld illustrate how functional literacy can be tailored to child-focused humanitarian settings. By utilizing digital pens, bilingual education, and community facilitators, this collaboration successfully connected over 10,000 IDCs with learning opportunities (AREAi & TheirWorld, 2024). This inclusive and innovative approach also earned the prestigious 2024 UNESCO Confucius Prize for Literacy (UNESCO, 2024).

Similarly, the USAID-backed Addressing Education in Northeast Nigeria (AENN) project, run by FHI 360, aided displaced students in Borno and Yobe States via non-formal learning centers and bilingual instruction in Kanuri and Hausa. This effort resulted in average score jumps of 17 % in literacy and 27 % in numeracy, successfully transitioning over 60% of students back into formal classrooms (Education.org, 2022).

Effective pedagogy for internally displaced children (IDC) must address their unique educational and psychological vulnerabilities. Empirical evidence underscores the importance of both emotional safety and trauma-informed instruction. For instance, Adebayo (2025) noted that using mother-tongue instruction in UNICEF's Accelerated Basic Education Programme (ABEP) successfully restored the academic interest and confidence of Yakaka, an 11-year-old in Borno State. Furthermore, AREAi evaluations showed a remarkable 97% comprehension rate in pilot camps utilizing native-language instruction and diagnostic testing (Guardian Nigeria, 2022; BusinessDay NG, 2022). These outcomes demonstrate that tailored, versatile teaching methods are crucial for student success.

Consequently, these studies present profound policy implications. Yusuf et al. (2020) emphasize the need for contextualized curriculum planning, participatory needs assessments, and the blending of numeracy and literacy programs with civic, livelihood, and health education. Additionally, continued investments in teacher development, school infrastructure, and multi-sectoral collaboration are

required to elevate the quality and reach of these interventions. These strategies align directly with the Transforming Literacy for Future Citizens (TLFC) framework, which advocates for adaptable, inclusive, and learner-focused practices to empower individuals in volatile environments.

Empirical data from Nigeria confirms that combining functional mathematics literacy skills with responsive teaching is highly effective in helping internally displaced learners rebuild their numeracy resilience. Evidence from child-focused and adult literacy programs—such as FastTrack, AENN, and ABEP—proves that these scalable strategies successfully meet the unique needs of displaced children in Benue and Plateau States. To build truly inclusive and equitable education systems for vulnerable populations, these evidence-based approaches must be formally integrated into standard educational policies and daily teaching practices.

MATERIALS AND METHODS

Design

To thoroughly explore the educational obstacles facing internally displaced children, this study utilized an explanatory sequential mixed-methods design. Quantitative survey data was collected and analyzed first, followed by qualitative interviews to provide in-depth context and interpretation of the numerical findings. It is intended to explore the 'why' behind quantitative results or to understand the mechanisms that may be driving those results. The quantitative aspects comprised descriptive survey and quasi experimental designs. In trying to evaluate effective implementation of responsive pedagogies, the learning challenges of ID children and informed educational policy to support responsive teaching methods were documented as part of the descriptive survey. On the other hand, assessing the impact of responsive pedagogies and functional literacy on learning outcomes (numeracy) of learners fall into the quasi experimental design of pretest, post test non randomised groups type.

Population, Sample and Sampling

The target population comprised 713 internally displaced children across designated IDP camps in Benue and Plateau States, Nigeria. This population included 379 males (50.6%) and 334 females (49.4%). Regionally, 613 pupils (85.97%) were located in Benue State, while 100 pupils (14.03%) were from Plateau State. Due to security constraints in specific conflict-affected zones, researchers used purposive selection to identify accessible areas. Consequently, 8 schools in Benue and 3 schools in Plateau were initially deemed safe and available for participation.

The final sample consisted of 488 children, including 274 males and 214 females. To balance demographics, the study combined purposive and stratified random sampling techniques based on gender and primary school grade level (Grades 4 and 5). However, because this study used a quasi-experimental design, true individual randomization was not feasible. Instead, researchers utilized intact classes, embedding all available pupils from the 3 Plateau schools and 6 selected Benue schools into the study.

The sample distribution was determined by regional school availability and safety profiles: In Plateau State, all the 3 available schools were purposively sampled due to their limited number and small student population. In Benue State, 6 out of the 8 available schools were sampled, strictly excluding institutions located in high-risk zones.

All selected institutions were coeducational and exclusively populated by internally displaced children. This diverse demographic profile is essential for analyzing the distinct educational challenges faced by displaced youth. Ultimately, this sampling framework provides actionable insights into how responsive pedagogy and functional literacy approaches can improve numeracy outcomes in crisis settings.

Research Instrument and validation

One research instrument was developed and used in this study. The Numeracy Ability Test (NAT) has 37 items. It is a multiple choice items of options A to D. The items were drawn from primary four and five curriculum using common entrance examinations items as guide.

The instrument was given to three experts- one in mathematics, one in measurement and evaluation and one in educational psychology for face validation and content validation for the NAT. The comments of the experts helped to re-shape the final instruments. The validators were requested to check whether or not the items conform to the subject-matter, if the items were clear, readable, free from ambiguity and can assess the basic area of the study. Also to check if the instrument is capable of achieving the purpose for which it is designed. Table of specifications, topics, objectives, research questions and hypotheses were given to the validators to guide them in validating the instruments. Based on the comments of the validators, some items in the instruments were restructured in terms of structure and grammatical accuracy.

The instrument was produced for use in trial testing. The trial testing of instrument was conducted using a sample of 100 pupils outside those sampled for main study. The trial testing data collected were subjected to analysis to obtain psychometric properties. Psychometric Analysis was carried out for NAT. The psychometric Analysis was an attempt to determine the quality of the test items in terms of difficulty and discrimination and how the options function in distracting indices (Nworgu, 2015) recommends the following ranges for four options MCQs:

1. 0.30-0.70 Difficulty for easiness indices.
2. 0.30-1.0 for discriminating indices.
3. The distracter indices are usually dependent on the number of options.

The items with distracter indices of zero were modified and selected. Items that scale through the analysis were featured in NAT while the ones that failed were discarded. In all 33 items survived out of 40 for NAT. The final instrument was subjected to reliability analysis with NAT having 0.84 using Kuder Richardson 21 formula. According to Agogo and Achor, (2020), the instrument was therefore said to be reliable.

Data Collection and Analysis

The NAT was administered as pretests in first week, then taught the pupils for six weeks and then administered them as post tests in the eight week. A total of eight weeks was used for the study. The trained research assistants who were their regular teacher did the teaching for six weeks. The junior researchers did the monitoring by visiting each school on routine (one per week) for the six weeks of teaching.

The statistics used for data analysis were mean, standard deviation, percentages and bar graphs for the descriptive data and Analysis of Covariance (ANCOVA) for the inferential data. Since full

randomisation was not possible because of the way the pupils were selected, the use of ANCOVA helped to correct the initial differences in cognitive ability of the pupils involved in the study.

RESULTS

Table 1: Mean Impact of Responsive and Functional Literacy Pedagogy on Learning Outcomes (Numeracy) of the Internally Displaced Children

Strategies			Pre Learning Outcomes (Numeracy)	Post Learning Outcomes (Numeracy)	Mean gain
Responsive and Functional Literacy Pedagogy	Mean		9.39	19.51	10.12
	N		215	215	
	Std. Deviation		5.07	5.88	
Conventional Strategy	Mean		10.38	16.12	5.74
	N		273	273	
	Std. Deviation		6.40	5.01	
Mean difference					4.38

Table 1 shows the mean impact of responsive and functional literacy pedagogy on learning outcomes (numeracy) of the Internally Displaced Children. The table shows that 215 Internally Displaced Children were taught numeracy using responsive and functional literacy pedagogy and 273 Internally Displaced Children were taught numeracy using conventional strategy. Data in Figure 2 shows that responsive and functional literacy pedagogy resulted in higher numeracy gains for internally displaced children (mean gain = 10.12) compared to a conventional strategy (mean gain = 5.74). While both groups showed improvement, the responsive pedagogy group began at 9.39 (SD=5.07) and improved to 19.51 (SD=5.88), resulting in a net advantage of 4.38 points over conventional instruction (pretest 10.38, SD=6.40; posttest 16.12, SD=5.01).

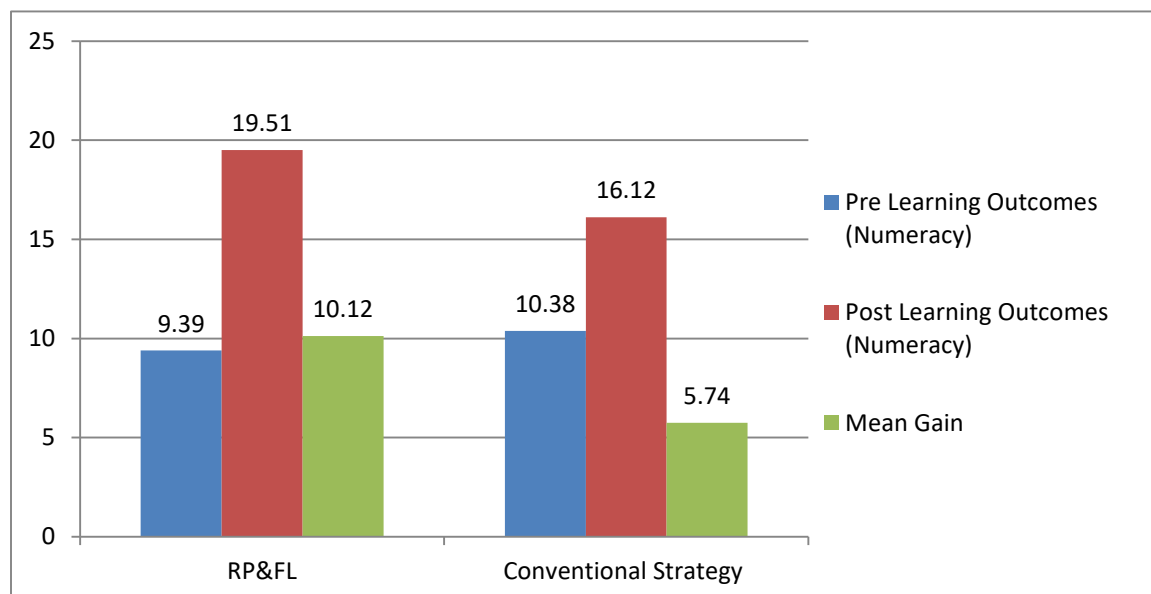


Figure 2: Pretest, Posttest and Mean Gain in Learning Outcomes of Internally Displaced Children taught Numeracy using Responsive and Functional Literacy Pedagogy(RP&FL) and Conventional Strategy.

Table 2: ANCOVA of Learning Outcome of Internally Displaced Children taught Numeracy using Responsive and Functional Literacy Pedagogy and Conventional Strategy

Dependent Variable: PostNumeracy

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Squared	Eta
Corrected Model	1503.890 ^a	2	751.945	23.003	.000	.087	
Intercept	43908.119	1	43908.119	1343.229	.000	.735	
PreNumeracy	124.839	1	124.839	3.819	.051	.008	
Strategies	1300.528	1	1300.528	39.786	.000	.076	
Error	15853.911	485	32.688				
Total	168739.000	488					
Corrected Total	17357.801	487					

a. R Squared = .087 (Adjusted R Squared = .083)

Table 2 shows that $F(1,485) = 39.786$; $p = 0.000 < 0.05$. Thus, the null hypothesis is rejected. This implies that there is significant difference in the mean learning outcome of internally displaced children taught numeracy using responsive and functional literacy pedagogy and those taught using conventional strategy. The partial eta square of 0.076 obtains for strategies means that 7.6 percent of Internally Displaced Children learning outcomes (numeracy) can be attributed to the strategies employed.

Table 3: Mean Impact of Responsive and Functional Literacy Pedagogy on Learning Outcomes (Numeracy) of the Internally Displaced Male and Female Children

Gender		Pre Learning Outcomes (Numeracy)	Post Learning Outcomes (Numeracy)	Mean gain
Male	Mean	9.34	20.28	10.94
	N	119	119	
	Std. Deviation	5.14	6.34	
Female	Mean	9.45	18.55	9.10
	N	96	96	
	Std. Deviation	5.00	5.13	
Mean difference				1.84

Table 3 shows the mean impact of responsive and functional literacy pedagogy on learning outcomes (numeracy) of the Internally Displaced male and female Children. Based on the table, 119 male and 96 female Internally Displaced Children (IDC) received numeracy instruction through responsive and functional literacy pedagogy. The male group improved from a mean pretest score of 9.34 (SD=5.14) to a posttest score of 20.28 (SD=6.34), resulting in a mean gain of 10.94. The female group improved from a mean pretest score of 9.45 (SD=5.00) to a posttest score of 18.55 (SD=5.13), resulting in a

mean gain of 9.10. While both groups showed significant improvement, the male IDC outperformed the female IDC by a margin of 1.84 in mean learning gain. The pretest, posttest and mean gain summary in learning outcomes of the Internally Displaced male and female Children taught numeracy using responsive and functional literacy pedagogy is as shown in Figure 3.

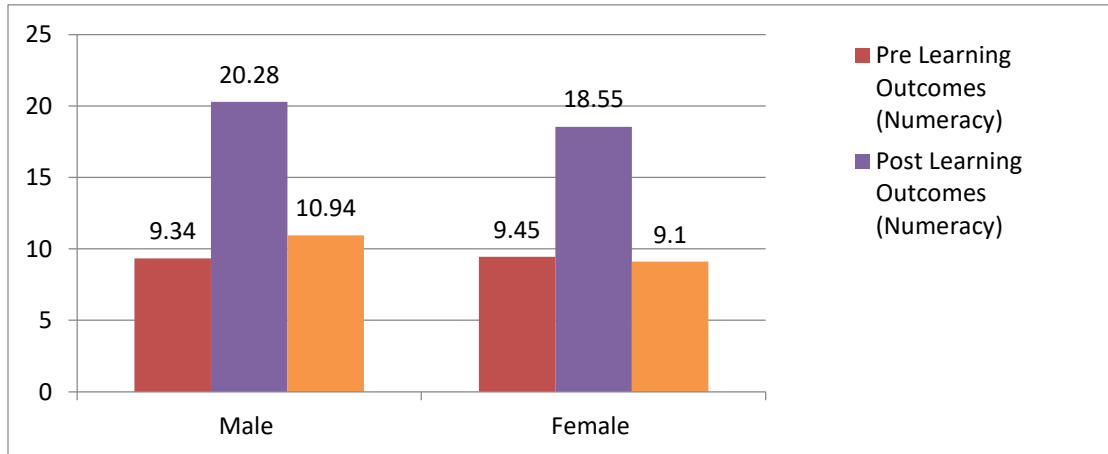


Figure 3: Pretest, Posttest and Mean Gain in Learning Outcomes of Internally Displaced Male and Female Children taught Numeracy using responsive and Functional Literacy Pedagogy

Table 4: ANCOVA of Numeracy Outcome of Internally Displaced Male and Female Children taught Numeracy using Responsive and Functional Literacy Pedagogy

Dependent Variable: PostNumeracy

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Squared	Eta
Corrected Model	274.915 ^a	2	137.457	4.081	.018	.037	
Intercept	20840.024	1	20840.024	618.708	.000	.745	
Pre Numeracy	116.764	1	116.764	3.467	.064	.016	
Gender	155.162	1	155.162	4.607	.033	.021	
Error	7140.825	212	33.683				
Total	89228.000	215					
Corrected Total	7415.740	214					

a. R Squared = .037 (Adjusted R Squared = .028)

Table 4 shows that $F(1,212) = 4.607$; $p = 0.033 < 0.05$. Thus, the null hypothesis is rejected. This implies that there is significant difference in the mean numeracy outcome of internally displaced male and female children taught numeracy using responsive and functional literacy pedagogy and those taught using conventional strategy. The partial eta square of 0.021 obtains for gender means that 2.1 percent of Internally Displaced Children learning outcomes (numeracy) can be accounted for by gender in responsive and functional literacy pedagogy class.

DISCUSSION OF FINDINGS

Findings on the use of responsive and functional literacy pedagogy and numeracy outcomes revealed that responsive and functional literacy pedagogy shows a significant improvement in numeracy outcomes. The mean gain of 10.12 in the responsive group is much higher than the 5.74 mean gain in the conventional group, indicating that this teaching approach is more effective at improving the numeracy skills of internally displaced children. The relatively high mean gain in the numeracy outcomes for the responsive pedagogy group suggests that this teaching method may be particularly suited for internally displaced children, who may face specific challenges like trauma, unstable environments, or limited prior educational experiences. The approach could potentially offer better engagement, which is critical for learning numeracy concepts. The difference of 4.38 suggests that the responsive pedagogy is more effective than the conventional method in supporting numeracy learning. This could be due to the pedagogy's emphasis on contextualized learning and active engagement, which might resonate more with children from displaced backgrounds who may need more flexible and practical approaches to learning. The partial eta square of 0.076 indicates that 7.6 percent of the variation in numeracy outcomes can be attributed to the teaching strategy. While this suggests that the strategy has an effect, there are likely other factors influencing numeracy achievement, such as individual student backgrounds, external support systems, or environmental factors. The fact that 7.6 percent of the variation in numeracy outcomes is explained by the teaching strategy suggests that responsive and functional literacy pedagogy can be a valuable tool for educators working with displaced children. Training teachers in these methods could help them address the unique needs of their students more effectively, particularly in subjects like numeracy, which may require hands-on and applied learning. Consistent with Merino (2025), these results confirm that play is a core pillar of effective early education rather than just a pastime. By blending intentional math instruction with purposeful play, educators ensure students remain highly engaged while meeting academic standards. This integrated strategy fosters a comprehensive curriculum that addresses immediate developmental growth and creates a robust path for long-term school success. In line with Isiaka and Efeturi (2024), these findings indicate that implementing culturally sustaining pedagogical frameworks significantly improves students' mathematical reasoning and engagement. Furthermore, confirming findings by Awgichew (2022), the results show a high prevalence of contextualized content in textbooks, with roughly 60% containing relevant visuals and nearly 45% incorporating examples from students' daily lives.

Educators in this program learn to identify the literacy practices used at home and explicitly communicate classroom literacy expectations to pupils and their families. By integrating these home-based approaches and materials, teachers create a cohesive learning experience, empowering children to bridge both worlds when engaging with text. This may be responsible for the effectiveness of this teaching approach in improving the numeracy skills of internally displaced children.

Findings on the use of responsive and functional literacy pedagogy and numeracy outcomes with reference to gender show that the male children in the responsive and functional literacy pedagogy group had a higher mean gain (10.94) compared to female children (9.10), with a difference of 1.84 in favor of males. There is significant difference in the mean numeracy outcome of internally displaced male and female children taught numeracy using responsive and functional literacy pedagogy and those taught using conventional strategy. This suggests that male children made slightly greater

progress in their numeracy skills compared to female children within the same teaching framework. The results suggest that there are small gender-based differences in numeracy outcomes, with male children showing a slightly higher gain than female children when taught using responsive and functional literacy pedagogy. The effect size of 2.1 percent indicates that gender has a small influence on the numeracy outcomes in this context. Given that gender accounts for only 2.1 percent of the variance, this suggests that focusing on gender alone might not be the most effective way to improve numeracy outcomes for displaced children. While gender does play a role, the impact is relatively modest, meaning that other factors (such as individual differences, teaching methods, classroom dynamics, or external support) likely account for the majority of the variability in learning outcomes.

Gender difference exists among internally displaced children in responsive and functional literacy pedagogy class. The presents study found that the use of responsive and functional literacy pedagogy is gender sensitive with reference to numeracy outcomes as there was significant difference in the numeracy outcomes of male and female internally displaced children. Contrary to Anaga's (2021) findings in Ghana, which noted significant improvements in core subject tutors' use of gender-responsive pedagogy without favoring either gender in performance, this study reveals a different pattern. While Anaga observed uniform progress among male and female tutors, the current results suggest that community-based mediators—such as family, relatives, and neighbors—play a critical role in supporting children's numeracy development in a gender-specific manner.

Key Implications of the Findings

Higher Pedagogical Effectiveness: The high mean gain indicates that a responsive approach—one that adapts to the immediate and contextual needs of the learner—results in nearly double the numeracy improvement of traditional rigid instruction class.

Suitability for Trauma-Informed Education: Because IDCs often experience high-stress environments, the responsive method likely improves numeracy by prioritizing emotional safety and mental engagement, rather than just rote memorization, which is critical when working memory is compromised by trauma.

Improved Engagement and Practical Application: Functional literacy pedagogy focuses on applying mathematical concepts in real-world contexts. For displaced children, this makes numeracy more relevant, fostering better understanding and engagement with concepts that might otherwise seem abstract.

Equalization of Learning Outcomes: The approach is effective at closing the gaps created by unstable backgrounds, providing a stable, structured learning

Gender Gap Persistence in Innovative Pedagogy: While responsive pedagogy generally improves learning outcomes over conventional methods, this finding indicates that innovative teaching methods do not automatically eliminate gender gaps in numeracy. Even when pedagogical methods are designed to be functional, socialized differences or classroom dynamics may cause boys to outpace girls in numerical skill acquisition, a common finding in many contexts.

Need for Gender-Specific Targeting in Numeracy: The higher gain for males suggests that "gender-neutral" responsive pedagogy may still underserved female children in the specific area of numeracy. To ensure equity, educators and curriculum designers should incorporate gender-responsive strategies that specifically boost girls' confidence and performance in mathematics, rather than relying solely on overall pedagogical improvements.

Context-Specific Performance (IDP Setting): The study shows that in high-stakes, crisis-driven environments (internal displacement), while numeracy skills improve generally, the gender gap persists. This implies that emotional factors, such as "math anxiety" or differing levels of confidence between boys and girls, may be more pronounced in IDP children, requiring tailored support to help girls overcome potential hurdles.

Advantages in Writing Over Numeracy: Research indicates that in this specific pedagogical framework (responsive pedagogy/functional literacy), the advantage is clearer in improving writing skills for both genders, with gendered disparities remaining smaller in literacy than in numeracy.

In summary, the findings imply that responsive and functional literacy pedagogy is an effective **replacement for conventional strategies**, but it must be supplemented with targeted gender-sensitive interventions in mathematics to close the gender gap in numeracy outcomes.

CONCLUSION

The study concluded that psychological and emotional support, cultural and linguistic consideration, safety and stability as well as access to resource control are more pressing needs for many IDCs, adaptability and flexibility play a significant role in their learning process in terms of accommodating their unique circumstances. The study concluded that responsive and functional literacy pedagogy is effective in improving numeracy outcomes for internally displaced children, with a significant mean gain and a moderate effect size. This approach seems to offer substantial benefits over conventional methods, and its integration into educational strategies for displaced populations could have meaningful, long-lasting impacts. The study further concludes that responsive and functional literacy pedagogy is gender sensitive with reference to the numeracy outcomes of internally displaced children.

Recommendations

Drawing upon the evidence gathered in this research, several recommendations have been formulated:

1. The class teachers should ensure that their learning environment is inclusive and supportive of their pupil's diverse backgrounds and needs.
2. The school authority should provide a secure and stable learning environment. This would enhance psychological and emotional support for the displaced children.
3. The state ministry of education should ensure adequate resources in educational settings for IDCs. This is critical in enhancing their learning experience, particularly given the challenges they face as displaced children.
4. Education policymakers should provide emergency education curriculum with a clear framework on the use of responsive and functional literacy pedagogy to tailor their approaches to meet the unique needs of the displaced populations.
5. Teacher training institutions should scale this approach to help educators understand how to implement responsive and functional literacy pedagogy that are more responsive to the unique challenges of internally displaced children aimed at improving the literacy of displaced populations.
6. Curriculum designers should integrate responsive teaching methods that focus on the functional application of numeracy skills in real-world contexts in the curriculum for the displaced children. This could help provide a more holistic understanding of what drives numeracy achievement in displaced children.
7. Six policy statement have been made in this study concerning IDCs. Federal and State governments are encouraged to study and implement them as applicable.

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