

The Role of Early Childhood Education in Shaping Future Academic Success in Nigeria: An Empirical Study

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Abstract:

This study examined the role of Early Childhood Education (ECE) in shaping future academic success in North-central Nigeria. Despite global recognition of early learning as foundational to lifelong achievement, access to quality ECE in Nigeria remains uneven, raising concerns about school readiness and long-term academic outcomes. A mixed-method design was employed, involving 420 participants (260 pupils, 100 teachers, and 60 parents) from public and private schools across Benue, Kogi, and Kwara States. Data were collected using questionnaires, classroom observations, interviews, and pupils' academic records. Quantitative data were analysed using descriptive statistics, Pearson Correlation, and Regression Analysis, while qualitative data were thematically analysed. Findings revealed a strong positive relationship between ECE attendance and later academic success ($r = .74, p < .05$). Teacher qualification ($\beta = .41$), play-based learning ($\beta = .33$), parental involvement ($\beta = .29$), and learning resources ($\beta = .24$) significantly predicted academic outcomes ($R^2 = .67$). Children exposed to quality ECE demonstrated higher literacy, numeracy, classroom behaviour and confidence. However, challenges such as inadequate funding, unqualified caregivers, poor

infrastructure and unequal access persists. The study concludes that quality ECE is indispensable for improving foundational learning and long-term educational achievement. It recommends increased investment, compulsory pre-primary education, strengthened teacher training, improved regulation, and enhanced parents – school partnerships.

Keywords: Early Childhood Education, Academic Success, School Readiness, Foundational Learning, Nigeria.

Introduction

Education does not begin at the school gate; it begins in the earliest interactions between a child and their environment within the home, the community, and the informal spaces where curiosity is first awakened. The early years of life, particularly from birth to age five, represent a period of remarkable cognitive, emotional and social growth. During this stage, neural development occurs at an unparalleled rate, laying the foundation upon which all subsequent learning is built (Shonkoff et al., 2021; Centre on the Developing Child, 2020). However, early Childhood Education is concerned with structured care, stimulation and learning opportunities provided during the years preceding primary education. It focuses on the total development of the child, including cognitive, emotional, social, moral and physical growth. Effective ECE environments typically combine play-based learning, language enrichment, numeracy readiness, routine formation, creativity and interpersonal development. Rather than merely preparing children to recite facts, quality programmes cultivate curiosity, confidence and positive attitudes towards learning, Edinoh, Oche & Omolabake (2024) [1-5]

In contemporary educational discourse, Early Childhood Education (ECE) is no longer viewed as a preparatory stage but as a critical determinant of lifelong learning trajectories and societal development (UNICEF, 2019; UNESCO, 2022). Increasingly, scholars argue that the quality of early learning experiences significantly shapes children's readiness for formal schooling, their academic progression, and even their future economic productivity (Heckman & Karapakula, 2019; Britto et al., 2021). Within Nigeria, ECE occupies a strategic position in national education policy. The Federal Republic of Nigeria recognises pre-primary education as the first level of formal education, designed to promote holistic development – cognitive, physical, social and emotional (FRN, 2013). However, despite policy recognition, implementation remains uneven, particularly across rural and economically disadvantaged communities (Ibrahim et al., 2025; Sofoluwe, 2021) [6].

Observably, recent studies indicate that children who attend structured early learning programmes demonstrate stronger literacy, numeracy and social competencies compared to those without such exposure (Melhuish et al., 2020; Yoshikawa et al., 2020). In the Nigerian context, Edinoh et al. (2024) further emphasised that ECE contributes to intellectual, emotional and social development, thereby strengthening future academic outcomes. Yet, disparities in access and quality continue to widen educational inequalities. While some children benefit from stimulating, resource-rich environments, others enter primary school without basic readiness skills, placing them at an early disadvantage (Edinoh, Onah & Oluwole, 2025, Okonkwo & Eze, 2022; Adebayo, 2023). Against this backdrop, this study investigates the extent to which early childhood education shapes future academic success in North-central Nigeria, with a focus on both access and quality dimensions [7-9].

Statement of the Problem

Across Nigeria, a troubling pattern persists: many children begin primary school without the foundational skills necessary for meaningful learning. They struggle with basic literacy, lack numeracy awareness, and often exhibit limited attention spans and social readiness. These early disadvantages are rarely temporary; they accumulate over time, leading to persistent academic underachievement and, in some cases, eventual disengagement from schooling (World Bank, 2021; Uwezo Nigeria, 2022). The irony is that these challenges are not primarily rooted in children's abilities, but in unequal access to quality early learning opportunities. While policy frameworks

acknowledge the importance of ECE, implementation remains inconsistent. In many public and low-cost private centres, classrooms are overcrowded, instructional materials are scarce, and caregivers often lack professional training in early childhood pedagogy (Ogunbowale et al., 2025; Afolabi, 2022) [10].

For families in rural and low-income communities, the barriers are even more pronounced. Financial constraints, distance to schools, and limited awareness of early learning benefits restrict access to quality ECE. Consequently, children from disadvantaged backgrounds are more likely to enter school unprepared, thereby perpetuating cycles of inequality (UNESCO, 2022; Okolie et al., 2020). In North-central Nigeria, these disparities are particularly evident due to variations in infrastructure, funding, and educational investment across states. While some schools provide structured and stimulating early learning environments, others operate under severe constraints, limiting their ability to support holistic child development [11].

Although global research strongly supports the long-term benefits of ECE, there remains a need for context-specific empirical evidence within Nigeria – particularly in North-central regions – regarding how early childhood experiences influence later academic success. This study therefore seeks to address a critical question: To what extent does Early Childhood Education influence future academic success, and what factors determine its effectiveness in North-central Nigeria?

Theoretical Perspectives

Piaget (1952) proposed that children learn actively through exploration and gradually progress through stages of cognitive development. His theory suggests that early learning environments should provide age-appropriate materials and opportunities for discovery. Vygotsky (1978) stressed the importance of social interaction and guided learning. Through the concept of the zone of proximal development, he argued that children can achieve more when supported by adults or capable peers. This has strong implications for teacher guidance and collaborative play in ECE settings. Bruner (1966) advanced the concept of scaffolding, whereby adults structure learning experiences to help children master increasingly complex tasks. His work reinforces the importance of intentional teaching in early childhood classrooms. Bronfenbrenner (1979) explained that child development is shaped by multiple environmental systems, including the family, school, neighbourhood and broader society. This theory highlights the importance of parental involvement, school quality and supportive communities. Montessori (1967) advocated prepared learning environments that encourage independence, concentration and self-directed exploration. Her approach continues to influence contemporary early years pedagogy [12].

Literature Review

Conceptualising Early Childhood Education in the 21st century

Early Childhood Education (ECE) in the twenty-first century is no longer viewed as a preparatory stage of ‘keeping children occupied’ before formal schooling. Rather, it is increasingly understood as a rich, formative period in which the foundations of lifelong learning, identity and well-being are carefully nurtured. Contemporary perspectives emphasise that ECE should provide intentional, developmentally appropriate and holistic learning experiences that attend to the cognitive, emotional, social and physical development of the child (OECD, 2021; Whitebread et al., 2021; Edinoh, Oche & Omolabake 2024) [13].

What makes this modern understanding particularly compelling is its human-centred orientation. Children are no longer seen as passive recipients of knowledge but as active participants in their own learning journeys. Classrooms are expected to be spaces where curiosity is encouraged, mistakes are part of learning, and relationships matter as much as outcomes. In this regard, Biesta (2020) argues that education – especially in the early years – should move beyond narrow academic goals to include the formation of responsible, reflective and socially conscious individuals. Similarly, Moss (2019) advocates for a transformative vision of ECE that prioritises well-being, inclusion, democratic

participation and social justice. In practical terms, this means creating environments where children feel safe, valued and empowered to express themselves. Within the Nigerian context, this redefinition is particularly important, as it challenges long-standing traditions of rote learning and positions early education as a space for nurturing agencies, voice and creativity [14].

Early Childhood Education and Academic Success

A substantial and growing body of empirical research demonstrates that the benefits of quality ECE extend far beyond the early years. Children who experience stimulating and supportive early learning environments tend to enter primary school with stronger literacy and numeracy foundations, better attention control and more positive attitudes towards learning (Melhuish et al., 2020; Yoshikawa et al., 2020). These early advantages often accumulate over time. Children who begin school well-prepared are more likely to engage actively in classroom activities, build confidence in their abilities and sustain academic progress. Conversely, those who start behind frequently struggle to catch up, leading to a cycle of underachievement.

Heckman and Karapakula (2019) provide a compelling economic and developmental argument, showing that investments in early childhood yield some of the highest returns in education, including improved academic attainment, higher productivity and reduced inequality. Their work reinforces the idea that early learning is not merely a social service but a strategic investment in national development. Within Nigeria, emerging studies echo these global findings. Okonkwo and Eze (2022) and Adebayo (2023) report that children who attend quality ECE programmes demonstrate significantly better school readiness and academic performance than their peers without such exposure. These findings are particularly relevant in regions where disparities in early learning opportunities contribute to long-term educational inequality [15].

Teacher Quality and Learning Outcomes

At the heart of effective early childhood education lies the teacher. While curriculum design, infrastructure and policy frameworks are important, it is ultimately the teacher who translates these into meaningful learning experiences for children, Edinoh, Asemota & Wakili (2026). Research consistently shows that well-trained teachers are better equipped to create engaging learning environments, facilitate play-based instruction and respond to the diverse developmental needs of young learners (Darling-Hammond et al., 2020; Egert et al., 2020). Skilled educators understand how to scaffold children's learning – providing just enough support to help them progress while encouraging independence and exploration, Ogunode, Edinoh & Olatunde-Aiyedun (2023).

However, the Nigerian context presents a more complex reality. Many ECE centres particularly in low-income and rural areas, rely on caregivers who lack formal training in early childhood pedagogy (Ogunbowale et al., 2025). This gap often results in overly rigid teaching methods, limited child engagement and missed opportunities for developmental growth.

This challenge underscores the urgent need for professionalisation in the ECE sector, including structured training programmes, certification requirements and continuous professional development. When teachers are empowered, children benefit directly through richer and more meaningful learning experiences.

Play-Based Learning and Cognitive Development

One of the most defining features of contemporary early childhood education is the renewed emphasis on plays. Far from being a trivial or recreational activity, play is now widely recognised as a powerful medium through which children learn, explore and make sense of the world. Scholars such as Zosh et al. (2022) and Hirsh-Pasek et al. (2020) argue that play-based learning supports creativity, problem-solving, language development and social interaction. Through play, children experiment with ideas, negotiate roles, express emotions and develop critical thinking skills in ways that structured instruction alone cannot achieve [16].

Importantly, play-based learning aligns closely with how young children naturally learn. It allows them to connect new knowledge with prior experiences, thereby making learning more meaningful and memorable. In well-designed ECE settings, play is not left to chance but is carefully structured and guided by teachers to achieve specific learning outcomes. In the Nigerian context, however, play is sometimes misunderstood or undervalued, particularly in settings where academic achievement is narrowly defined. Expanding awareness of the educational value of play is therefore essential for improving ECE quality and outcomes.

Parental Involvement and Ecological Influences

Children's learning does not occur in isolation within the classroom. It is shaped by a broader network of relationships and environments, particularly the home. Drawing on Bronfenbrenner's ecological systems theory, contemporary research highlights that development is influenced by interactions across multiple contexts, including family, school and community. Recent studies reaffirm that parental involvement plays a crucial role in enhancing children's academic outcomes. Activities such as reading together, storytelling, engaging in conversations, and supporting homework create a learning-rich environment that reinforces school experiences (Jeynes, 2021; Hill & Tyson, 2020).

However, in many Nigerian communities, socio-economic constraints, limited parental education, and demanding work schedules may restrict the level of home-based support available to children. Addressing this challenge requires not only school-based interventions but also community engagement and parent education programmes that empower families to support early learning effectively.

Challenges in Early Childhood Education Delivery in Nigeria

Despite growing recognition of its importance, the delivery of quality ECE in Nigeria remains uneven and faced with challenges. These challenges are not merely technical but deeply structural, reflecting broader socio-economic and policy realities. Key issues include inadequate funding, which limits the availability of learning materials and infrastructure; poor classroom conditions, particularly in rural areas and a shortage of qualified teachers. Additionally, weak regulatory frameworks allow for significant variations in quality across both public and private centres. Recent studies (Edinoh et al. 2024; Ibrahim et al., 2025; Afolabi, 2022; Okolie et al., 2020) highlight that these constraints continue to undermine the effectiveness of early childhood programmes. Access also remains inequitable, with children from disadvantaged backgrounds often excluded from quality ECE opportunities. These challenges suggest that improving ECE in Nigeria requires more than policy declarations; it demands sustained investment, effective governance, and a commitment to equity [17].

Gap in the Literature

While global and national studies provide strong evidence of the benefits of early childhood education, there remains a notable gap in context-specific empirical research, particularly within North Central Nigeria. Fewer empirical studies have specifically examined how early childhood experiences shape later academic outcomes in North Central Nigeria. Much of the existing literature either focuses on policy analysis or concentrates on urban centres, leaving rural and regional dynamics, realities and later learner performance underexplored. Furthermore, fewer studies have systematically examined how early childhood experiences translate into measurable academic outcomes in later schooling within this region.

This study addresses this gap by providing empirical, region-specific evidence on the relationship between ECE and future academic success in North Central Nigeria. In doing so, it contributes to both scholarly discourse and policy development by offering insights grounded in local realities. This study therefore contributes to the literature by providing empirical evidence from three states in North Central Nigeria on the relationship between ECE and future academic success.

Methodology

Research Design

This study adopted a mixed-method descriptive survey design, combining quantitative and qualitative approaches to provide a comprehensive understanding of how Early Childhood Education (ECE) influences future academic success. This design was particularly suitable because it allowed the study not only to measure statistical relationships but also to capture the life experiences of teachers, parents, and pupils within real classroom contexts (Creswell & Plano Clark, 2019; Johnson et al., 2020). While the quantitative strand generated measurable evidence on relationships between ECE variables and academic outcomes, the qualitative strand provided deeper insights into classroom practices, parental engagement, and systemic challenges affecting implementation.

Population of the Study

The population of the study comprise of:

- i. Lower primary school pupils
- ii. Early Childhood Education teachers
- iii. Parents/guardians

These groups were selected because they represent the core stakeholders in early childhood development and foundational learning processes.

Sample and Sampling Technique

A total of **420 respondents** participated in the study:

| Category | Number |
|----------|--------|
| Pupils | 260 |
| Teachers | 100 |
| Parents | 60 |

A combination of stratified random sampling and purposive sampling techniques were used. Stratification ensured balanced representation across public and private schools, as well as gender distribution. Purposive sampling enabled the selection of schools with functional ECE centres, ensuring that participants had relevant experience [18].

Instruments for Data Collection

Data were collected using multiple instruments to ensure depth and triangulation:

- i. Early Childhood Education Quality Questionnaire (ECEQQ)
- ii. Classroom Observation Checklist
- iii. Parent Interview Guide
- iv. Pupils' Academic Records

These instruments captured key variables such as teacher quality, learning environment, parental involvement, instructional methods and academic performance.

Validity and Reliability

The instruments were validated through expert review to ensure content and face validity. Reliability testing using Cronbach's Alpha yielded 0.89, indicating a high level of internal consistency and suitability for empirical analysis (Taber, 2018).

Method of Data Analysis

Data analysis involved both descriptive and inferential statistics:

- i. Mean and standard deviation
- ii. Pearson Product-Moment Correlation
- iii. Multiple Regression Analysis
- iv. Thematic Analysis (for qualitative responses)

These analytical techniques enabled the study to examine patterns, relationships, and predictive factors influencing academic success.

Results

Table 1. Demographic Characteristics of Respondents.

| Variable | Frequency | Percentage |
|-----------------|-----------|------------|
| Male Pupils | 128 | 49.2% |
| Female Pupils | 132 | 50.8% |
| Public Schools | 210 | 50.0% |
| Private Schools | 210 | 50.0% |

Interpretation

The demographic distribution reflects a balanced and representative sample. Gender representation is nearly equal, while the equal inclusion of public and private schools strengthens the comparability and generalizability of findings across different educational settings [19].

Table 2. Mean Ratings of ECE Contributions to Academic Success.

| Variable | Mean | Interpretation |
|----------------------------|------|----------------|
| Literacy Readiness | 4.31 | High |
| Numeracy Readiness | 4.18 | High |
| Classroom Behaviour | 4.07 | High |
| Confidence/Social Skills | 4.11 | High |
| Primary School Achievement | 4.24 | High |
| Creativity/Problem-Solving | 3.96 | High |

The findings indicate overwhelmingly positive perceptions of ECE contributions. Literacy readiness recorded the highest mean (4.31), underscoring the critical role of early exposure to language-rich environments.

Even the lowest-rated variable – creativity/problem-solving – remains high, suggesting that ECE contributes meaningfully to both academic and socio-emotional development.

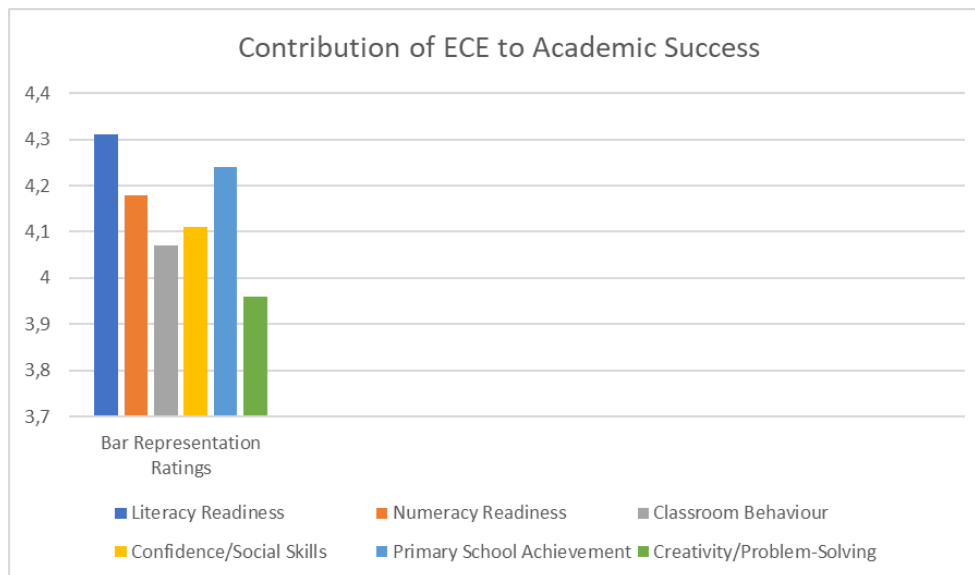


Figure 1. Contributions of ECE to Academic Success (Bar Representation).

Insight:

The chart visually reinforces that ECE impacts multiple domains simultaneously, not just academic skills but also behaviour and confidence [20].

Table 3. Correlation Between ECE Attendance and Academic Success.

| Variable | r-value | p-value | Decision |
|------------------------------------|---------|---------|-------------|
| ECE Attendance vs Academic Success | 0.74 | 0.000 | Significant |

Interpretation

The correlation coefficient ($r = 0.74$) indicates a strong positive relationship. This suggests that children who attend ECE programmes are significantly more likely to achieve better academic outcomes later.

The result is statistically significant ($p < .05$), leading to the rejection of the null hypothesis.

Table 4. Regression Analysis Predicting Academic Success.

| Predictor | Beta (β) | t-value | Sig. |
|-----------------------|------------------|---------|------|
| Teacher Qualification | 0.41 | 6.12 | .000 |
| Play-Based Learning | 0.33 | 5.08 | .000 |
| Parental Involvement | 0.29 | 4.77 | .001 |
| Learning Resources | 0.24 | 3.85 | .002 |

$R^2 = 0.67$

Interpretation

The model explains 67% of the variation in academic success, indicating strong predictive power. Teacher qualification emerges as the most influential factor, followed by play-based learning and parental involvement. This highlights that quality not just access drives outcomes [21].

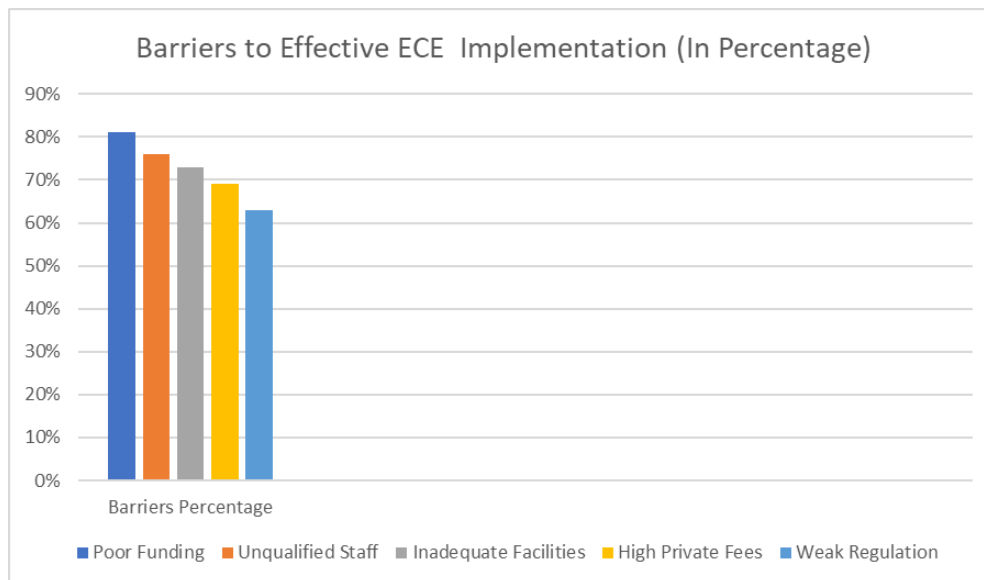


Figure 2. Barriers to Effective ECE Implementation.

Interpretation

The chart reveals that systemic constraints remain deeply entrenched. Poor funding stands out as the most critical issue, affecting infrastructure, staffing, and learning resources.

Discussion of Findings

The findings of this study tell a compelling and deeply human story about the power of early learning experiences. At its core, the evidence demonstrates that children do not simply ‘catch up’ later if they miss quality early education rather, early advantages or disadvantages tend to persist and widen over time [22].

The strong relationship between ECE attendance and academic success ($r = 0.74$) underscores the idea that early learning is not optional enrichment but a foundational necessity. Children who are exposed to structure, stimulating environments develop confidence, curiosity and readiness that position them for success in later schooling. This aligns with contemporary research emphasising that foundational skills acquired early shape lifelong learning trajectories (Yoshikawa et al., 2020; Shonkoff et al., 2021).

One of the most striking findings is the central role of teacher quality. The data clearly show that qualified teachers are not merely facilitators of instruction but architects of learning environments. They create spaces where children feel safe to explore, ask questions and make mistakes conditions essential for meaningful learning. Similarly, the significance of play-based learning reinforces a critical shift in educational thinking. Learning in early childhood is most effective when it is engaging, interactive and meaningful. Through play, children develop not only academic skills but also resilience, collaboration, and creativity qualities increasingly valued in modern societies [23], [24], [25], [26].

Parental involvement further highlights that education is not confined to classrooms. Children thrive when learning is reinforced at home through conversation, storytelling and emotional support. This interconnectedness reflects the broader ecological perspective of child development. However, the study also exposes persistent systemic challenges. The high percentages associated with funding gaps, unqualified staff, and inadequate infrastructure reveals that ECE in Nigeria is still constrained by structural inequalities. These challenges disproportionately affect children in rural and low-income communities thereby, reinforcing cycles of educational disadvantage [27], [28], [29].

Conclusion

This study confirms that Early Childhood Education is a powerful determinant of future academic success in North-central Nigeria. It strengthens literacy, numeracy, behaviour, confidence and overall readiness for formal schooling. However, the benefits of ECE are not automatic, they depend heavily on quality, accessibility and systemic support. Without deliberate investment and policy commitment, disparities in early learning opportunities will continue to undermine educational equity. ECE is therefore not merely an educational stage, it is the foundation upon which the entire education system rests.

Recommendations

Based on the findings, the following recommendations are proposed:

- a. Compulsory Pre-Primary Education: The government should make at least one year of quality ECE compulsory.
- b. Increased Funding: Greater financial investment is needed to improve infrastructure, materials, and staffing.
- c. Teacher Professional Development: Continuous training should be provided to enhance pedagogical competence.
- d. Promotion of Play-Based Learning: Curriculum frameworks should emphasise child-centred and experiential learning.
- e. Parental Engagement Programmes: Schools should actively involve parents in early learning processes.
- f. Improved Regulation of ECE Centres: Stronger monitoring systems should ensure quality standards.
- g. Equity-Focused Policies: Targeted interventions should support rural and disadvantaged communities.
- h. Longitudinal Research: Future studies should track children over time to better understand long-term impacts.

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