

INFLUENCE OF EARLY CHILDHOOD EDUCATION ON ACADEMIC ACHIEVEMENT OF PRIMARY SCHOOL PUPILS IN NASARAWA SOUTH SENATORIAL DISTRICT, NASARAWA STATE

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ABSTRACT

This study examined the influence of Early Childhood Education on Academic Achievement of Primary School Pupils in Nasarawa South Senatorial District, Nasarawa State. Two research questions and two hypotheses guided the study. The study used a descriptive research design. The population consisted of 29,315 primary 4 pupils in Nasarawa South senatorial district. A sample of 368 primary 4 pupils was used. The instrument used to collect data is titled "Academic Achievement Test (AAT)". The instrument yielded the validity index of 0.82, and the reliability coefficient of 0.85 was obtained using Kuder-Richardson (KR-21) method. Two research questions were answered using descriptive and inferential statistics (mean and standard deviation) and two hypotheses were tested at 0.05 level of significance using t-test. The study revealed that there is a significant difference in the mean scores of pupils who attended early childhood education and pupils who did not attend early childhood education in both Mathematics and English language. The study concluded that quality Early Childhood Education is equated to an engraved mark on a rock which is difficult to erase when provided by qualified teachers, it would enhance provision of solid academic foundation for lifelong development which will no doubt enhance pupils' mental ability, exhibition of acceptable moral behaviour and social interaction among peer groups. The study recommended among others that every child should be given individual opportunity to explore and experience formal schooling in the early years learning through ECE as this will further enhance their mental development and ability.

Keywords: Early Childhood, Education, Academic achievement

Introduction

Education is an important instrument for building nations. According to Nwosu (2023), education is a process of organised instruction and training planned to transfer information and the acquisition of capabilities, skills, and potential to the learners to participate competently in the progress of the nation. It encompasses the all-round improvement of individuals. Children's education has been assigned a diversity of names like pre-school education, pre-primary education, pre-Kindergarten, and nursery or Montessori school education by various Educators, Psychologists, and policymakers and has also been included in different phases of education (Khan, Tahir, & Aurangzeb, 2019).

It can be argued that early childhood education (ECE) is a vital cornerstone for a child's overall development and intellectual progress on a worldwide scale. A child's early years have a significant impact on who they may become both now and in the future. Dutrow (2025) asserts that early learning experiences have a lasting impact. This is an important time that greatly influences a person's trajectory for lifelong learning. The first eight years of a child's life are typically referred to as early childhood (ECE), sometimes known as early childhood development education (ECDE). Specifically, it is the period before full-time schooling begins, for children aged 3 to 5 years old. Furthermore, it includes crèches, nurseries and kindergartens, while primary education refers to education given to children between 6 and 10 years old. The period is seen as a turning point in a child's development for building human capital in the form of the basic social, cognitive, and scholastic skills needed for educational achievement.

For a child's eventual academic achievement to reflect their creative, critical, and analytical skills in school, mathematics instruction is essential throughout the very formative early years of life. The focus of the 21st century has shifted to producing convincing evidence that children possess a high degree of mathematical proficiency from birth and that children's ability to abstract is determined by their cognitive development in early childhood education (Alsina & Salgado, 2021). Developmental psychologists now focus on what young children can accomplish rather than what they cannot (Burman, 2016). Accordingly, children from birth until they start primary school are typically the focus of current research on early childhood mathematics (Björklund HeuvelPanhuizen & Kullberg, 2020). Psychologists' attitudes toward teaching children mathematics have changed, and they have started to design new pathways specifically for the improvement of mathematical knowledge from birth (Clements & Sarama, 2020).

International attention in early childhood mathematics education has increased progressively in recent years, and it is now described as being important for overcoming mathematical illiteracy (Demir & Demir, 2022) and for meeting the requirements of a knowledge-based society. An over-emphasis on skill-based literacy and math standards can exclude balanced approaches to child development. The commodification of early childhood programming can place profit above the child (Smith, Tesar & Myers, 2016).

This consensus on the significance of mathematics education emphasises that teaching mathematics in early childhood has comprehensive advantages for children in both the short- and long-term at school. A quality mathematics education is important for early years children because it is the strongest predictor of mathematics achievement later in life (Simoncini et al., 2020; Watts, Duncan, Clements & Sarama, 2018). Arguably, one of the key determinants of children's achievement is early math skills and mathematical literacy. Obtaining mathematical skills at an early age can increase the level of school accomplishment and enhance career opportunities in adulthood (Lee, 2017). Thus, developing children's mathematical abilities at an

early age is crucial for building long-term success in school (Watts et al., 2018). Furthermore, it has been discovered that children who experience quality education throughout the early years acquire significantly better outcomes in international tests, such as PISA and PIRLS (Alsina & Berciano, 2020).

Another key subject in a child's academic formation is English Language; English is the second language (L2) of most people who are not native speakers. The language has become one of the globally accepted means of communication and learning. The foundation laid during the early years of a child's life can have a lasting impact on various aspects of their academic journey. Markova (2017) compared the academic performance of pupils with and without formal kindergarten experience using English language achievement test and revealed a significant difference between the English language performance of pupils with formal kindergarten experience and those without such experience. The result also showed a significant difference between the academic performance of male primary five pupils with formal kindergarten experience and those without such experience, and a significant difference between the academic performance of female primary five pupils with formal kindergarten experience and those without it. This study is related to the current study, but we are not doing a comparative study here. The research conducted by Mokrovan (2015) on analyses social skills from grade 1-3 and finds that children who experienced high-quality ECE have a high degree of social and academic achievements in grade one compared to children who have not been provided with high-quality ECE. Accordingly, children who have had the chance to attend ECE succeed in adapting to the primary school environment, and they do outperform their peers who did not get ECE or who get incomplete schooling.

Oniwon (2015) conducted a study on kindergarten achievements as a predictor to primary five mastery of English language skills. The assumption of interest was to test whether there might be any similarity in brightness in English language acquisition in the fifth form of primary school education by comparing children who got kindergarten preparedness and those who did not. These pupils were observed to be significantly different; primary school learners with kindergarten performed better than their peers without kindergarten. This proves the importance of early childhood education in preparing children for success in primary school.

Early childhood education attendance is widely considered an important foundation for children's subsequent academic development. Exposure to early childhood education provides children with opportunities to develop the knowledge, skills, attitudes and behaviours needed for successful participation in formal schooling. Early childhood education centres are expected to provide an appropriate learning environment that responds to children's developmental needs, interests and abilities while preparing them for future academic activities. Through appropriate early learning experiences, children begin to develop basic language, numeracy, cognitive, social and emotional skills that can facilitate their adjustment and performance when they enter primary school.

The potential influence of early childhood education on pupils' academic achievement and their subsequent development makes it an important area of educational concern. Investment in early childhood education can provide children with experiences that extend beyond immediate learning outcomes and contribute to their long-term educational development. Children who have access to quality early childhood education may develop stronger foundational skills and greater readiness for primary school learning. Consequently, early childhood education can serve as an important mechanism for reducing learning disadvantages

among children from different social and economic backgrounds and can provide children with a stronger opportunity to succeed in formal education.

Early childhood education can therefore be regarded as the foundation upon which subsequent learning is built. Children who enter primary school without adequate foundational learning experiences may encounter difficulties in acquiring more complex academic skills. The early years provide an opportunity to introduce children to basic concepts, communication skills, problem-solving abilities, social interaction and appropriate learning habits before they are exposed to the more structured academic demands of primary education. A strong foundation at this stage can facilitate children's ability to understand, retain and apply new knowledge as they progress through the education system.

Early childhood education also contributes to the holistic development of the child. It provides opportunities for physical, motor, health, nutritional, intellectual, aesthetic, emotional and social development. These dimensions of development are interconnected and can influence a child's readiness to participate effectively in classroom activities. For instance, the development of language and cognitive abilities can facilitate comprehension, while social and emotional development can help children interact appropriately with teachers and peers and participate actively in learning. Similarly, appropriate physical and health development can support children's regular participation in school activities.

The relationship between early childhood education and later academic achievement is therefore important because the competencies developed during the early years may provide the basis for subsequent learning. Although early childhood education and primary education are distinct levels of education, they complement one another in the child's educational progression. Early childhood education prepares children for the demands of primary education, while primary education builds upon the foundational knowledge and skills acquired during the early years. However, the extent to which early childhood education contributes to pupils' academic achievement at the primary school level may vary depending on the quality, accessibility and nature of the experiences provided.

It is against this backdrop that this study sets its premise to investigate influence of early childhood education on academic achievement of primary school pupils in Nasarawa South Senatorial District, Nasarawa State.

Statement of the Problem

Despite continuous efforts by the government to improve educational infrastructure and provide learning resources in primary schools in the Nasarawa South Senatorial District, the academic achievement of primary school pupils remains a major concern. Many pupils continue to demonstrate low levels of achievement in basic school subjects, particularly mathematics and English language. This situation raises concerns about the extent to which pupils are acquiring the knowledge and skills expected at the primary school level. According to UNICEF (2021), academic achievement among pupils in Northern Nigeria was reported to be as low as 45%, compared with a national average of 60%. The persistence of low academic achievement among primary school pupils may constitute a major challenge to the attainment of the objectives of Universal Basic Education in Nasarawa State.

Separately, early childhood education is recognised as an important stage in children's educational development because it provides children with foundational experiences and skills needed for subsequent learning. At this stage, children are expected to develop basic cognitive, language, social, emotional and pre-literacy skills that can facilitate their transition into primary education. In recognition of the importance of this stage, the Nigerian government has

introduced measures aimed at expanding access to and improving the quality of early childhood education. One of such measure is the integration and formalisation of early childhood education within the basic education system and the provision of early childhood education centres in primary schools.

However, the existence of early childhood education programmes does not necessarily guarantee that children receive adequate foundational learning experiences. Concerns remain about the quality, availability and effectiveness of early childhood education in some primary schools. These concerns become particularly important in view of reports that some pupils complete primary education without acquiring basic reading, writing and numeracy skills. Where children do not receive adequate early learning experiences, they may enter primary school without the foundational competencies required to cope effectively with subsequent academic tasks. Consequently, the quality and nature of children's early childhood education experiences may be an important factor to consider in understanding variations in primary school academic achievement.

It is against this background that this study seeks to examine the influence of early childhood education on academic achievement of primary school pupils in Nasarawa South Senatorial District, Nasarawa State.

Objectives of the Study

The general objective of this study is to investigate the influence of early childhood education on academic achievement of primary school pupils in Nasarawa South Senatorial District, Nasarawa State. Specifically, the study seeks to:

1. Determine how early childhood education influences primary school pupils' academic achievement in Mathematics in Nasarawa South Senatorial District.
2. Examine how early childhood education influences primary school pupils' academic achievement in English Language in Nasarawa South Senatorial District.

Research Questions

To guide this study, the following research questions were raised:

1. What is the difference in mean achievement score of pupils who attended early childhood education and the pupils who did not attend early childhood education in Mathematics in Nasarawa South Senatorial District?
2. What is the difference in mean achievement score of pupils who attended early childhood education and the pupils' who did not attend early childhood education in English Language in Nasarawa South Senatorial District?

Research Hypotheses

The following null hypotheses are formulated and were tested at 0.05 level of significance:

- H₀₁ There is no significant difference in the mean achievement score of pupils who attended early childhood education and the pupils' who did not attend early childhood education in Mathematics in Nasarawa South Senatorial District.
- H₀₂ There is no significant difference in the mean achievement score of pupils who attended early childhood education and the pupils' who did not attend early childhood education in English Language in Nasarawa South Senatorial District.

Research Design

The study adopted descriptive survey research design. The population consisted of 29,315 primary 4 pupils from 23 primary schools in Nasarawa South Senatorial District. The sample size of this study consists of 368 primary 4 pupils using multistage sampling procedure. The respondents were first Clustered in their Local Government Areas. A simple random

sampling technique was used to select schools, and a proportionate sampling technique was used to distribute the sample size across the schools. The instrument used in this study is Academic Achievement Test (AAT). To establish the validity of instrument, the instrument was given out to experts in Measurement and Evaluation Unit, Department of Educational Foundations, Faculty of Education (Nasarawa State University, Keffi) and the experts scored the instrument with a combined content validity index of 0.82. The reliability of the instrument was determined through a pilot test on 20 pupils, and the data collected were analysed using the Kuder-Richardson (KR-21) reliability method. The reliability coefficient of 0.85 was obtained. Mean and standard deviation were used to answer the research questions, while an independent-samples t-test was used to test the null hypotheses at the 0.05 level of significance.

Results

Research Question One: What is the difference in mean achievement score of pupils who attended early childhood education and the pupils' who did not attend early childhood education academic achievement in Mathematics in Nasarawa South Senatorial District?

Table 1: Mean and Standard Deviation for the difference in mean achievement score of pupils who attended early childhood education and the pupils' who did not attend early childhood education in Mathematics.

	ECE	N	$\bar{X}$	Std. Dev	Std. Error Mean
Mathematics	ECE	165	16.55	2.55	0.199
	Primary education	203	12.63	2.21	0.155

Table 1 shows the mean score of pupils who attended early childhood education and the pupils who did not attend early childhood education. The result revealed that 165 pupils attended early childhood education with a mean score of 16.55 and standard deviation of 2.55 while pupils who did not attend early childhood education are 203 with mean score of 12.63 and standard deviation of 2.21.

Research Question Two: What is the difference in mean achievement score of pupils who attended early childhood education and the pupils who did not attend early childhood education, on academic achievement in English Language in Nasarawa South Senatorial District?

Table 2: Mean and Standard Deviation for the difference in mean achievement score of pupils who attended early childhood education and the pupils' who did not attend early childhood education in English Language.

	ECE	N	$\bar{X}$	Std. Dev	Std. Error Mean
English Language	ECE	165	15.78	2.60	.203
	primary education	203	12.65	1.73	.122

Table 2 shows the mean score of pupils who attended early childhood education and the pupils who did not attend early childhood education. The result revealed that 165 pupils attended early childhood education with a mean score of 15.78 and standard deviation of 2.60 while pupils who did not attend early childhood education are 203 with mean score of 12.65 and standard deviation of 1.73.

Hypothesis one: There is no significant difference in the mean score of pupils who attended early childhood education and the pupils' who did not attend early childhood education academic achievement in Mathematics in Nasarawa South Senatorial District.

Table 3: t-test analysis for score of pupils who attended early childhood education and the pupils' who did not attend early childhood education academic achievement in Mathematics in Nasarawa South Senatorial District.

t-test for Equality of Means								95% Confidence Interval of the Difference	
Group	N	Mean	Std. Dev	Sig	t	df	Sig. (2-tailed)	Upper	Lower
Maths	ECE	165	16.55	2.553	15.769	366	.010	4.40	3.43
	Primary education	203	12.63	2.213	15.539				

Df 366, $\alpha = 0.05$, © SPSS version 23

Table 3 presents the independent-samples t-test comparing the Mathematics academic achievement scores of pupils who attended Early Childhood Education (ECE) with those who did not attend ECE in Nasarawa South Senatorial District. The results show that pupils who attended ECE had a higher mean Mathematics achievement score ($M = 16.55$, $SD = 2.553$) than pupils who did not attend ECE ($M = 12.63$, $SD = 2.213$). The mean difference between the two groups was 3.92 points. The t-test result indicates that the difference was statistically significant, $t(366) = 15.769$, $p = .010$. Since the p-value of .010 is less than the 0.05 level of significance, the null hypothesis, which states that there is no significant difference in the mean Mathematics achievement scores of pupils who attended ECE and those who did not attend ECE, is rejected.

This implies that there is a significant difference in the Mathematics academic achievement of pupils who attended ECE and those who did not attend ECE in Nasarawa South Senatorial District. The higher mean score of pupils who attended ECE indicates that they performed better in Mathematics than those who did not attend ECE.

Hypothesis two: There is no significant difference in the mean achievement score of pupils who attended early childhood education and the pupils who did not attend early childhood education in English Language in Nasarawa South Senatorial District.

Table 4: t-test analysis for mean achievement score of pupils who attended early childhood education and the pupils' who did not attend early childhood education in English Language in Nasarawa South Senatorial District.

t-test for Equality of Means N								95% Confidence Interval of the Difference	
Group	N	Mean	Std. Dev	Sig	t	df	Sig. (2-tailed)	upper	lower
English	ECE	165	15.78	2.61	13.780	366	.020	3.57	2.68
	Primary education	203	12.65	1.73	13.239				

Df 366, $\alpha = 0.05$, © SPSS version 23

Table 4 presents the independent-samples t-test comparing the English Language achievement scores of pupils who attended Early Childhood Education (ECE) with those who did not attend ECE in Nasarawa South Senatorial District. The results show that pupils who attended ECE had a higher mean English Language achievement score ($M = 15.78$, $SD = 2.61$) than pupils who did not attend ECE ($M = 12.65$, $SD = 1.73$). The mean difference between the two groups was 3.13 points. The t-test result indicates that the difference between the two groups was statistically significant, $t(366) = 13.780$, $p = .020$. Since the p-value of .020 is less than the 0.05 level of significance, the null hypothesis, which states that there is no significant difference in the mean achievement scores of pupils who attended ECE and those who did not attend ECE in English Language, is rejected. This implies that there is a significant difference in the English Language achievement of pupils who attended ECE and those who did not attend ECE in Nasarawa South Senatorial District. The higher mean score of pupils who attended ECE indicates that they performed better in English Language than pupils who did not attend ECE.

Discussion of Findings

Finding from hypothesis one revealed that there is significant difference in the mean achievement score of pupils who attended early childhood education and the pupils' who did not attend early childhood education academic achievement in Mathematics in Nasarawa South Senatorial District. This finding is in agreement with Awwal and Mohammed (2020) who discovered that there was significant difference on influence of early childhood education on academic performance of primary pupils in mathematics. The finding also aligns with Kwizera, Oyebimpe and Andala (2021) who revealed that primary school learners' academic performance in mathematics is greater if children have done early childhood education than when they entered primary school without ECE. Also, the finding is consistent with Mwaba, Kusanthan, Kepson and Menon (2016), who discovered that there was a relationship between pre-schooling and the performance of pre-schooled lower primary school pupils in mathematics, noting that pupils who attended pre-primary school are more exposed cognitively than their counterparts who did not attend pre-primary school. The finding is consistent with Bibi and Ali (2018), who revealed that pupils with pre-school education significantly outperformed their counterparts without such experience in mathematics.

Finding from hypothesis two revealed that there is significant difference in the mean achievement score of pupils who attended early childhood education and the pupils' who did not attend early childhood education academic achievement in English Language in Nasarawa South Senatorial District. This finding aligns with Solang, et al (2024) who revealed that there is a significant difference in academic achievement scores in English Language, meaning ECE pupils performed better than the non ECE counterparts. Further, the finding accepts that of Kepson (2015) who discovered that there is a relationship between pre-schooling and performance in English language in Grade One and Two. This implied that pupils with ECE performed better than those without ECE. Also, the finding is consistent with Ernest-Ehibudu and Peter-Kio (2017), who found a significant influence of preschool experience and type of preschool attended on academic achievement of primary school pupils in English language. Summarily, ECE pupils performed better than the non-ECE pupils.

Conclusion

Based on the findings, the study concluded that attendance at early childhood education has a significant relationship with pupils' subsequent academic achievement in both Mathematics and English Language in Nasarawa South Senatorial District. The study established that pupils who had attended early childhood education differed significantly in their mean

achievement scores from those who had not attended early childhood education in Mathematics. This suggests that exposure to early childhood education provides children with foundational learning experiences that can support the acquisition of mathematical concepts and skills at the primary school level.

Recommendations

The following recommendations were made based on the findings of this study:

1. The Nasarawa State Government should strengthen access to early childhood education programmes. More ECE centres should be established, particularly in underserved communities in Nasarawa South Senatorial District, to ensure that more children have the opportunity to acquire foundational learning experiences before entering primary school.
2. Parents and guardians should be encouraged to enrol their children in early childhood education before primary school. Parents should be sensitised on the importance of ECE in developing children's early literacy, numeracy, communication, social and cognitive skills, rather than considering early childhood education as unnecessary or merely a period for childcare

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