



Relationship between Age and Students' Achievement in Mathematics in Senior Secondary Schools in Delta Central Senatorial District of Nigeria

P. O. E., Efeludu, P. A. U. Ossai
Department of Guidance and Counseling,
(Measurement and Evaluation),
Delta State University, Abraka

ABSTRACT

This research delved into the association between students' age and their performance in mathematics within senior secondary schools in Delta State, Nigeria. The study aimed to address a single research question and test a null hypothesis. Employing a correlation research design, a sample comprising 392 students from 28 government-owned secondary schools, all in senior secondary 2 (SS2), was meticulously selected. The sampling process involved both multi-stage and simple random techniques. The study employed a Mathematics Achievement Test (MAT) as the primary assessment tool. The research question was effectively answered utilizing the Product Moment Correlation Coefficient, while the null hypothesis underwent scrutiny through the application of Simple Linear Regression at a significance level of 0.05. The study findings demonstrated a noteworthy and statistically significant correlation between age and students' academic accomplishments in mathematics. Consequently, it can be inferred that age plays a discernible role in influencing students' academic achievements in the domain of mathematics. In light of the outcomes, the study concludes that age indeed exerts an impact on students' academic achievements in mathematics. As a recommendation, the study suggests that, except in instances of exceptional aptitude such as giftedness, adhering to and enforcing policies regarding age limits in educational contexts is advisable. This ensures that age-related factors are duly considered and accounted for in efforts to optimize students' mathematical academic performance.

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INTRODUCTION

Age can be viewed ordinarily as the number of years of one's existence or life in relation to time, Age and maturation according to Egbule and Ugoji (2004), appear to affect cognitive growth development among children in school. According to the scholars, psychologists believe that achievement in learning increases with maturation. To justify, perhaps, that age could be a factor in learning, different levels of education such as pre-primary, primary, post-primary/ secondary and post-secondary education, were spelled out in National Policy on Education (1981), as cited by Ossia (2013).

Some studies (Ebenuwa – Okoh, 2016; Josiah & Adejoke, 2014, Okole, 2017)

reported that age significantly affects academic performance among studentSs. There are also other researchers (Rabgay, 2015; Amro et al. 2015; Onuekwusi, 2015) who conducted investigations showing that academic achievement is not a function of age. Thus, there appears to be inconsistencies on issues concerning age and academic achievement just as there exists in sex and mathematics achievement (Ossai, 2023).

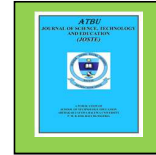
A review of some empirical researches by Josiah and Adejoke (2014), Motari, et al. (2015), Thoren et al. (2016) and Unal (2019) was conducted in this study. Josiah and Adejoke (2014), as cited by Efeludu (2022), examined the effect of gender, age and mathematics anxiety on college students'

*Corresponding author: Ossai, P. A. U.

✉ aqbadobipeter@gmail.com

Department of Guidance and Counselling, Delta State University, Abraka.

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achievement in algebra. The study used a survey design; a sample of 160 participants was selected through purposive sampling from computer and mathematics students of Federal College of Education in Lagos and Ogun States in South-West Nigeria. Mathematics Anxiety rating scales, questionnaire and scores from first semester course in algebra titled MAT 111 were used as instrument in the study. Data analysis showed that the three independent variables did not significantly affect students' achievement in algebra. However, it was found that students whose ages ranged from 18-15 years scored more than those whose ages were above 30 years. The scholars recommended that the interaction effect of the variables should be investigated

The study by Momanyi, et al. (2015) produced findings that appear similar to (and different from) the findings of Josiah and Adejoke (2014). The study focused on effect of students' age on academic motivation and academic performance among high school students in Kenya. The study adopted an *ex-post facto* design. A sample of 489 students chosen through stratified random sampling technique, from form two and form four students in secondary schools within Nakuru municipality. Questionnaire, school academic records of previous year constituted the means for data collection. The statistical tools used were mean, frequencies, percentages, standard deviation, product moment correlation coefficient and analysis of variance. The findings showed that students' age had a significant effect on their academic performance but students' age had no significant effect on academic motivation. The non-significant effect of age on academic motivation differentiates these findings from the results reported by Josiah and Adejoke (2014).

The investigation by Thoren, et al. (2016) seemingly produced mixed results. The scholars studied Relative Age Effects in Mathematics and Reading across students, Time and Classes. In accordance with Berlin's law of school environment, three student cohorts were chosen. Data were collected from compulsory state-wide proficiency programme tests assessing proficiency in mathematics and reading comprehension. Data analysis was done using multilevel Framework. The findings indicated that there were age affects in favour

Grade2; this reduced in size in Grade3. Also, by Grade 8, and relative age effects vanished in reading in favour of the relatively young in mathematics. There were no relative age effects among student with or without immigrant background, students' cohort or across classes.

The study of Unal (2019) produced clear-cut findings compared to the foregoing Unal studied the impact of relative age effect (RAE) on mathematics achievement in Turkey Survey model was used in the study a sample of 6456 student was drawn from the fourth grand in 242 school. Also, 6079 student were sample from eighth grade in 218 schools. Hierarchical multiple regression was used in data analysis. The result showed that RAE impacted on the fourth and eighth grades mathematics scores of Turkey. The youngest children born just before the cut-off had the worst performance. The researchers suggested that awareness on RAE should be raised among pre-service and in-service programme for teachers.

In this study, one research question and one null hypothesis were addressed. The two ascertained the relationship between age and academic performance in mathematics.

METHODOLOGY

The study was correlational. A sample of 392 students was drawn from a population of 22158 senior secondary two (SS2) students in government-owned secondary school in Delta Central Senatorial District of Delta State. The sampling was done using multistage and simple random sampling. A 30-item mathematics achievement test constructed by the researchers was used in the study. Students' age range was classified as 0 for 17 years and below while above -17- years was coded as 1. The two classes of age were correlated with student respective performances in the test administered. The statistical tools used were the Pearson's Product Moment Correlation and coefficient of determination as well as simple linear regression. The null hypothesis was tested at .05 level of significance.

Data Analysis

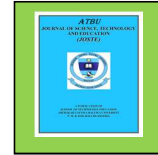
Analysis of data was done as follows;

*Corresponding author: Ossai, P. A. U.

✉ aqbadobipeter@gmail.com

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Research Question One: What is the relationship between age and academic achievement of students in mathematics?

Table 1: Pearson Product Moment Correlation(r) and Coefficient of Determination (r²) of Age and Academic Achievement of Students in Mathematics.

Variable	N	R	r ²	r ² %	Decision
Age					
Academic Achievement	392	.11	0.01	1.00	Low positive relationship

Table 1 showed the r-value of 0.13 as the correlation value of the relationship between age and academic achievement of students in mathematics. The coefficient of determination (r²), was 0.01 and the amount contribution of age to academic achievement was 1.0%. The result showed a low positive relationship

between age and academic achievement of students in mathematics.

Hypothesis one: There is no significant relationship between age and students' academic achievement in mathematics.

Table 2: Linear Regression Analysis of Age and Students' Academic Achievement n Mathematics. Model Summary.

Model	R	r-square	Adjusted r-square	Std. Error of the Estimate		
1	.11	.01	.01	13.05		
ANOVA ^b						
Model		sum of Squares	df	Mean square	f	Sig.
1	Regression	783.93	1	783.93	4.60	.03 ^b
	Residual	66417.63	390	170.30		
	Total	67201.56	391			

α=0.05

Table 2 shows a linear regression output of the relationship between age and students' academic achievement in mathematics with computed F-value of 4.60 and a p-value of 0.03. Testing the null hypothesis at an alpha level of 0.05, the p-value of 0.03 was rejected. This indicated that there was a significant relationship between age and students' academic achievement in mathematics. The r² value of 0.01 showed that 1.00% of variance in academic achievement was accounted for by age.

DISCUSSION OF FINDINGS

The research question and its hypothesis examined the relationship between age and academic achievement of students in mathematics. The findings indicated that there was a significant positive relationship between

age and academic achievement of students in mathematics. The possible explanation for this finding could be that as students increase in age, they get mature and become more motivated to learn for improved performance. Another possible explanation for this finding could be that as students increase in age they develop the ability to overcome anxiety associated with their learning of mathematics for improved achievement. This finding is in line with Owolabi and Etuk-iren (2014) and Unal (2019) who showed that age positively influenced students' achievement in mathematics. This finding however, disagrees with Abubakar and Adegboyega (2012) and Abubakar and Oguguo (2011) who found no significant link between age and academic achievement of mathematics students. This finding also disagrees with Momanyi, et al.

*Corresponding author: Ossai, P. A. U.

✉ aqbadobipeter@gmail.com

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(2015) who reported that students' age had no significant effect on academic motivation.

From the findings, it can be decided other factors such as gender (Ossia, 2023), guessing (Ossia & Enwefe, 2023) and differential item functioning (Okagbare, et al. 2023) could play some parts in students' mathematics achievement. That is, no factor can be solely responsible for students' achievement went in mathematics. This study did not pay attention to the nature of the distribution of scores. Ossai (2016) stressed the need for skewness to be checked in distributions of test scores.

CONCLUSION AND RECOMMENDATION

In this study, age had a significant influence on students' achievement in mathematics. This is an addition to what exists in literature. It was recommended that, except in extreme cases of giftedness, government policy on age limits in primary and secondary institutions should be enforced.

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*Corresponding author: Ossai, P. A. U.

✉ aqbadobipeter@gmail.com

Department of Guidance and Counselling, Delta State University, Abraka.

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*Corresponding author: Ossai, P. A. U.

✉ aqbadobipeter@gmail.com

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