

## INFLUENCE OF SCHOOL FEEDING PROGRAMME ON ACADEMIC ACHIEVEMENT OF PRIMARY-3 PUPILS IN MATHEMATICS IN AKWA IBOM STATE, NIGERIA

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### **Abstract**

*This study examined influence of school feeding programme on academic achievement of primary-3 pupils' in Akwa Ibom State, Nigeria. Two hypotheses were formulated to direct the study. Ex-post facto research design was adopted for the study. A total sample of 1500 pupils out of 14,910 pupils were selected from 40 primary schools for the study using stratified and simple random sampling procedures 20 from schools who offered food services and 20 from schools who do not offer food services. The study instrument used for data collection was Mathematics achievement test. The reliability index of the instrument determined with Kuder – Richardson K-R-20 formula was .75. The result of the analyzed with independent t-test showed that pupils in schools that offered food services significantly performed better in the mathematics achievement test with 3.86 percentage points higher than those pupils in schools where food service are not offered ( $p < 0.001$ ). Gender significantly influenced primary 3 pupils' academic achievement in Mathematics in schools that offered food services ( $t=18.382$ ;  $p=0.000$ ). Based on these findings, it was recommended that provision of food services should be extended to all schools, both private and public in order for children to pay more attention be more attentive to learning and improve their ability to concentrate in school.*

**Keywords:** Gender, Provision of Food, Academic Achievement, Mathematics



## **Introduction**

Consistently low achievement in Mathematics in primary school remain a major hindrances to scientific and technology advancement of Nigeria. Mohammed (2017) identified poor nutrition and lack of feeding programme in Schools as a major reason why pupil performed poorly in Schools. According to Organization for Economic Cooperation and Development (OECD, (2012), lack of feeding programme in schools has resulted in pupils showing negative attitude toward mathematics, loss of interest and lack of attention in class which could adversely lead to poor academic performance of pupils in Mathematics. Elevated food insecurity, and the growing recognition that nutrition is critical and essential to the healthy development of young ones have led to the institution of school food programmes and promotion of healthy eating in communities and households to enhance academic achievement. Ngussa and Mbifile, (2016) stated that pupils' who do not participate in school breakfast are at risk for increased absences, adverse behavior, reduced concentration, and poor academic performance. Children whose parents report they often do not get enough to eat were more likely to have been suspended from school, have seen a psychologist, or have difficulty getting along with other children (Belot & James 2009). According to Li and O'Connell (2012), children who are provided with adequate nutrition, are more likely to have weakened body systems and reduced learning capacity and high failure and dropout rates.

The Provision of food in school is a fundamental intervention which can lead to the achievement of significant improvements in pupils' academic performance. Availability of food in schools is essential for learners to actively participate in teaching-learning process. Food is one of basic needs that should be met by every human being for effective functioning of the body and proper fulfillment of day-to-day activities. For pupils to concentrate effectively in reading, writing and doing other academic activities, they need to be provided with sufficient balanced diet. Pupils need nutritionally rich and diversified dietary

intake for adequate growth, mental health, immunity, energy and strength (Ngussa & Mbifile, 2016). Hoppu, Lehtisalo, Tapanainen, and Pietinen, (2010) have stated that the main reasons for providing food to pupils in school is to help young people to maintain their energy while at school and thus help them to learn mathematics and other subjects effectively. Hooton and Nicolle (2010) have also argued that without proper and reasonable amount of diet, children's concentration declines thus inhibit their capacity for effective learning of Mathematics. Provision of nutritionally rich school food to pupils in primary schools would keep them active and enhance their capacity to learn. According to Rausch (2013), protein-rich foods like meat, fish, milk and cheese are known to improve the creation of neurotransmitters which act as chemical messengers to the brain. On the other hand, protein energy malnutrition adversely affects the production of these neurotransmitter and leads to diminished mental status and poor student participation in class. Kubik (2003) argued that food is a major facet of education and provision of food benefits students emotionally and enhances their academic performance.

Mohammed (2017) examined the effect of school feeding programme on cognitive development in Mathematics in Zamfara State and found that school feeding programme had significant influence on the cognitive function and performance in Mathematics. Ngussa and Mbifile, (2016) studied the influence of food provision on pupils' participation in learning across 130 Primary Schools in Babati Rural District and found pupils in schools that offered food services irrespective of gender to have significantly higher mean score in learning participation than pupils in schools where food service was not offered. Basch (2011) observed that participation in school breakfast programs has been associated with reduced absenteeism, increased learning participation and enhanced academic achievement in Mathematics. Haroun, Harper, Wood and Nelson (2011) also reported that lunch time food provision and consumption in primary

schools improved healthy growth, encouraged pupils' school attendance and academic achievement in Mathematics.

Interpretation of the results of studies on effects of school feeding on learning should take into account potential confounding factors which could be biosocial, economic or cultural. One of such factors which has been studied extensively is the influence of gender. Gender is a cultural construct that distinguishes the roles, behaviour, mental and emotional characteristics between females and males developed by a society. Umoh (2003) defines gender as a psychological term used in describing behaviours and attributes expected of individuals on the basis of being born as either male or female. The results of studies on the influence of gender on academic performance vary widely. For instance, Ekeh (2003) observed that male primary school pupils performed better than females in science and mathematics. These differences in performance can be attributed to gender stereotyping which encourages male and female pupils to show interest in Mathematics and related to the roles expected of them in the society. Udousoro, (2018) studied the influence of gender and school feeding programme on mathematics ability of primary school pupils in Lagos State. The result of the study indicated that although pupils in schools that offered food services performed better than those from schools without food services, gender did not have any significant effect on the academic performance of students in Mathematics in schools that offered food services. Kosgei and Bii (2007) in their research on gender differences and attitude towards learning of mathematics found that both boys and girls have positive attitudes towards learning of mathematics though boys were more inclined than girls. A study by Asante (2012) in Ghana on the effect of school feeding programme on secondary students' attitudes towards mathematics found that boys had more positive attitudes towards mathematics than girls. Bharadwaj, Giorgi, Hansen and Neilson (2012) investigated the gender gap in Mathematics. They used data from the 2006 and 2009 Programme for International Students

Assessment (PISA) test and found that boys and girls differed significantly in perception about their own ability in Mathematics. Chrissy (2014) observed that feeding programme in school enhanced academic performance irrespective of gender. The researchers attributed improved performance in mathematics to concurrent improvement in cognitive functions such as memory and neural efficiency, and reduces absenteeism and tiredness. Florence, Asbridge and Asbridge, Paul and Veugelers, (2008) noted that learners with insufficient overall diet quality irrespective of gender are significantly more likely to do poorly in the teaching and learning process. Because of imbalanced diet these pupils may suffer from poor physical and mental process. Pupils with decreased overall diet quality were significantly more likely to perform poorly in classroom activities and consequently end up with poor general performance. Guzel (2004) observed that the attitude of female pupils towards mathematics was more positive than male pupils in schools that provided food services. Despite general awareness about the potential influence of gender, and disparity in study findings on the effect of gender on pupils' performance in Mathematics persists. Hence, there is a need for further studies on gender differences in pupils' achievement in Mathematics in primary schools in the context of school feeding programme with a view of suggesting possible intervention strategies.

### **Hypotheses**

The following null hypotheses were formulated to guide the study.

- 1). Pupils in schools that offer food services do not significantly differ from their pupils in schools where food service is not offered in their academic achievement in Mathematics
- 2). There is no significant influence of gender on pupils' academic achievement in Mathematics based on schools who offered food services

**Materials and Methods**

The study area was Akwa Ibom State Nigeria. The research design used for this study was the ex-post facto design. The researcher used this design because the independent variables which are provision of food and gender of pupils were variables that have occurred already and the researcher had no direct control over them. The population for the study consisted of all primary 3 pupils in all three Education Zones of Akwa Ibom State, which comprise Uyo, Eket and Ikot Ekpene Education Zones. A multi-stage sampling technique involving stratified and simple random technique were adopted to select 1500 pupils from 164 public mixed primary schools spread across the State with a total of 14,910 male and female pupils in primary 3. The schools were stratified based on gender and local government area. A total sample of 1500 pupils for the study; 899 pupils were from 20 schools selected who offered food services while 601 pupils were from 20 schools who did not offer food services. The data collection instrument were mathematics achievement test items constructed by the researchers using State primary five Mathematics syllabus. The instrument consisted of two sections, A and B. Section A described the bio-data of the respondent which include gender while section B consisted of 30 items constructed by the researchers used to test pupils' ability in Mathematics tasks. The instrument was face-validated by two experts in Measurement and Evaluation from the University of Calabar and two Mathematics Educators in primary schools. Corrections were pointed out by the experts and adjusted by the researchers and the

document was considered valid. Reliability index of the Mathematics achievement test instrument was established through Kuder Richardson formula K-R20 which gave an estimate of .75. The statistics package for

social sciences (SPSS) computer programme was used to analyze the data collected. The data for the hypotheses were analyzed using Independent t-test for the two hypotheses

**Results**

The result of the analysis is presented in the tables 1 and 2. The hypotheses were tested at .05 significance level.

**Hypothesis one:** Pupils in schools that offered food services do not significantly differ from pupils in schools where food service is not offered in academic Mathematics achievement.

The independent variable in this hypothesis is provision of food while the dependent variable is pupils' academic achievement in Mathematics. To test this hypothesis, pupils were grouped into two (school that offered food service and school without food service ). Based on the classification, their means were compared using the independent t-test analysis and the result is presented in Table 1.

**Table 1:** Independent t-test analysis of the mean difference in Mathematics academic achievement between pupils in schools that offered food services and those that did not offer food service.

Variable	N	X	SD	t	p-value
Academic achievement					
With Food services	601	22.89	4.32		
Without food services	899	18.96	3.63	18.382*	.000
Total	1500	20.53	4.28		

\*Significant at 0.05 level of significance

The result of the analysis (t=18.382; p=0.000) as presented in Table 1 indicated that Pupils in schools that offered food services significantly differ in Mathematics

academic achievement with 3.93 mean percentage points higher than those pupils in schools where food service were not offered. With this result, the null hypothesis was

rejected at 0.05 level of significance and alternate hypothesis was accepted. Thus, the pupils' academic achievement in Mathematics is significantly influenced by food provision. The provision of food in school influenced the pupils' participation in learning, and thus, enhances their academic achievement in mathematics.

**Hypothesis two:** There is no significant influence of gender on pupils' academic achievement in Mathematics based on school who offered food

services. The independent variable in this hypothesis is provision of food, intervening variable is gender while the dependent variable is pupils' academic performance. To test this hypothesis, gender was classified into two groups (Male and female). Based on the classification, their means were compared using the independent t-test analysis and the result is presented in Table 2.

**Table 2:** Independent t-test analysis of influence of gender on pupils' academic achievement in Mathematics based on school who offered food services

Variable	N	X	SD	t	p-value
Gender					
Male	345	24.34	4.05	10.410*	.000
Female	256	20.94	3.89		
Total	601	22.89	4.32		

\*Significant at 0.05 level of significance

The result of the analysis ( $t= 10.410$ ;  $p=0.000$ ) as presented in Table 2 indicates that there is a significant influence of gender on pupils' academic achievement in Mathematics based on the schools who offered food services.. With this result, the null hypothesis was rejected was rejected at 0.05 level of significance and alternative hypothesis was accepted. Male pupils had a performance better in Mathematics (mean score of 24.34) than their female counterpart (mean score of 20.94) in schools where food services are offered.

### Discussion

The result of the first hypothesis revealed that Pupils in schools that offered food services significantly differ from their counterpart in schools where food service was not offered in their academic achievement in Mathematics. This is supported by Hooton (2010) who argued that without balanced and adequate amount of dietary intake, children's concentration declines and their mind inhibited from concentrating in learning. Kubik (2003) argued that food is a major facet of education. Provision of food benefits students emotionally

and enhances their good performance in academics. Effective food provision in schools, therefore, leads not only to healthier children, but to improved attainment in their studies. He also added that hunger affects concentration, but well-nourished children fare better at schools.

The result of the second hypothesis revealed that there is a significant influence of gender on pupils' academic achievement in Mathematics in school who offered food services. The finding of this study also agreed with Bharadwaj, Giorgi, Hansen and Neilson (2012) who investigated the gender gap in Mathematics and found that boys and girls differ significantly in perception about their own ability in Mathematics. Kosgei, and Bii (2007) in their research on gender differences and attitudes towards learning of mathematics among primary school pupils found that both boys and girls have positive attitudes towards learning of mathematics though boys were more inclined than girls. The research carried out by Asante (2012) in Ghana found that boys had more positive attitudes towards mathematics than girls. This implies that gender difference accounted significantly to

pupils' academic achievement in Mathematics among primary 3 pupils in the study area.

### **Conclusion**

Based on the finding of this study, it could be concluded that food provision in schools become very necessary and essential because it enhances academic performance irrespective of gender by improving cognitive functions such as memory and neural efficiency and reduces absenteeism and tiredness. Therefore, food provision is very important factor and should be considered to enhance pupils academic performance in Mathematics.

On the basis of findings of the study, the provision food services to all private and public schools is recommended for in order to enhance the attention of pupils to learning and improve their ability to concentrate in school, and thus enhances their academic achievement in Mathematics.

The government authority, schools, parents and other school stakeholders should strive to sustain effective food provision in schools in order to raise the level of pupils' participation in learning. The likely effect of gender on the mathematics of children in the study setting should be further be explored with a view to providing required support and opportunities for female and male students to learn effectively and perform well in mathematics.

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