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School quality and teachers' characteristics as correlates of Pupils academic achievement in mathematics in nkanu west local government area of Enugu state

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Abstract
The study was designed to determine the relationship between school quality and teacher's characteristics on primary school pupils learning outcome in Mathematics in Nkanu West Local Government Area of Enugu State. Two research questions and two null hypotheses guided the study. Correlational research design was adopted. Population of the study comprised of 665 teachers from the 54 public primary schools in the area. A sample of 100 teachers were selected for the study using simple random sampling technique. Two research instruments; Class Size Questionnaire (CSQ), Teacher's Attitude towards Teaching Questionnaire (TATTQ) and primary five pupils' overall academic achievement in Mathematics in internal examinations from 2014/15 academic session to 2017/18 academic sessions were used as instrument for data collection. The instrument was validated by three experts; two from Childhood Education and one from Measurement and Evaluation all from the Department of Educational Foundation, University of Nigeria, Nsukka. Cronbach Alpha was used to measure the internal consistency and co-efficient of 0.92 and 0.79 were obtained with an overall co-efficient of 0.85. Data collected were analyzed using Pearson Product Moment Correlation Coefficient to answer the research questions and hypotheses using SPSS version 23.0 to test at 0.05 level of significance. The study disclosed that a positive, high and significant relationship between class size, teachers' attitude towards teaching and pupils academic achievement in Mathematics in Nkanu West Local Government Area of Enugu State. Based on the findings, the researchers recommended among others that State Government should recruit more mathematics teachers in order to tackle the problem of large class-size for effective teaching and learning.

Keywords: mathematics, learning outcome, class size, Teachers attitude

Introduction

Primary education is the first formal schooling system a child is exposed to after home education. It welcomes the child to the process of socialization under the tutelage of a teacher. Primary education is a pupil-centred environment that prepares and grooms the mind of a child for future academic endeavours. The Federal Republic of Nigeria in her National Policy on Education (2013), defined primary education as the education given to children aged 6-12 years. With primary education, the rest of the education system is built upon it and is the key to the success or failure of the whole system. This is evident by the fact that, basic literacy and numeracy skills as well as sound attitudes are developed in the right way in primary education. In primary schools, Mathematics, English language and one major Nigerian language (Hausa, Yoruba or Igbo) are among the core subjects offered by every pupil in the primary school. Mathematics is not only considered as an important subject in primary schools but also regarded as the father of all science subjects. Mathematics is a science subject that deals with counting and measuring of numbers. Mathematics, according to Gouba (2008) [14] deals with logical reasoning and quantitative calculations. Mathematics is a body of knowledge essential for the achievement of scientific and technological nation (Anaduaka & Okafor, 2013) [7].

In Nigeria, despite the fact that the government has clearly confirmed the importance of Mathematics by making it a core and compulsory subject at primary school levels, primary school pupil's academic achievement in the components of primary school Mathematics has not been encouraging over the years. In primary school, Mathematics is broken down into six themes, which are Numbers and Numeration, Basic Operations, Measurement, Algebraic Process, Practical and descriptive geometry and Everyday Statistics. Despite Federal and State governments' effort towards the prioritization of Mathematics in primary schools, pupils' performance in both internal and external examinations such as National Common Entrance and State Common Entrance Examinations and other entrance examinations into secondary schools is still very low and below expectation (Akinsola, 2010) [4].

Mathematics according to Maliki, Ngban, and Ibu (2009) [17], is a subject that affects all aspects of human life at different degrees. However, the poor academic achievement of pupils in the subject is a source of concern to all educational stakeholders. This is because poor academic achievement of primary school pupils at this level, which is the level that supposed to prepare pupils for higher education and useful living in the society, will have serious consequences amongst which are inability of the primary school pupils to meet the requirements for admission into secondary schools and tertiary institutions. According to Muraina and Muraina (2014) [18], academic achievement is not only a pointer to the effectiveness or otherwise of schools but a major determinant of the future of youths in particular and the nation in general. The academic achievement of pupils in mathematics is dependent on the level of pupils understanding and mastery of the subject. Bossaert, Doumen, Buyse and Verschueren (2011) [8], defined academic achievement as learner's success in meeting short or long term goals in any given subject. According to Good (2009), academic achievement is the

knowledge obtained or skills developed in the school subjects usually designed by test scores or marks assigned by the teacher. Academic achievement can be commonly measured through examinations or continuous assessment.

According to Odeh, Oguche and Ivagher (2015), a number of factors are said to have contributed to the pupils' poor academic achievement in school. The authors stressed that a host of these factors may surround pupils' poor achievement in school which may include: poor study habits and lack of available resource materials, poor school climate, indiscipline, inadequate facilities, school quality, teachers' characteristics, teachers' attitude towards learning, class size, teachers' ineffectiveness, the teaching method and the type of learning environment available for both the pupils and the teachers. From the array of factors responsible for pupils' poor learning outcomes, this paper focused on school quality and teachers' characteristics. School quality includes school climate, class size, school location and school belongings among others (Akinsolu, 2010) [5]. For the purpose of this study, class size was considered.

Class size is another school quality that plays a stimulating role in the academic achievement of primary school pupils. There is a consensus among researchers and educational scholars that, pupil's achievement decreases as class size increases (Muraina & Muraina, 2014) [18]. The effect of class-size on academic achievement has been debated and researched for many years, this has been inconclusive. Class size refers to educational tools that can be used to describe the average number of pupils per class in a school. In emphasizing the importance of class-size to the teaching and learning process, the Federal Republic of Nigeria in her National Policy on Education (NPE) (2013), recommended that for effective teaching and learning at the primary level, the teacher-pupil ratio shall be 1:35. To achieve effective teaching and learning in primary school, teacher figure becomes important.

A teacher is one who engage in interactions with learners for the purpose of effecting a change in their behaviours. Teachers are essential in the entire educational system of any nation and are pivots on which education wheels revolve (Ibe, Nworgu & Anyaegbunam, 2016) [15]. Ikediugwu (2005) [16], defined a teacher as a person who has undergone approved professional training in education at appropriate levels capable of imparting knowledge, attitudes and skills to the learner. According to Aleke (2016) [6], teacher is seen as one who is professionally trained to impart knowledge, attitudes and skills to the learner. The teacher is ultimately responsible for translating educational policies and principles into actions based on practice during interaction with the pupils. The Federal Republic of Nigeria in the National Policy on Education (FRN, 2013), also recognized the importance of teachers by stating that no nation's education system can be greater than the standard of their teachers. Hence, Fenstermacher and Richardson in Odunaike, Ijaduola and Amoda (2013) [20], opined that teachers remain the major factor in any educational system, and their quality of teaching is undoubtedly one of the most important factors shaping the teaching and learning as well as academic achievement of pupils. The process of teaching and learning in any school environment also depends on the teachers' characteristics. In the view of Stumbo and Mc Walter (2010) [21], teacher characteristics are qualities of a teacher which include academic qualification, experience, instructional leadership and attitude towards teaching. Others includes; teachers' teaching methods and use of instructional materials. However, this paper would focus on teachers' attitude to teaching.

Attitude is a psychological construct on how a person reacts to events or situations. Attitude could be explained as a consistent tendency to react in a particular way-often positively or negatively toward any matter. Attitude possesses both cognitive and emotional components. Attitude towards the teaching profession is a pivotal quality that determines a teacher's willingness to develop and grow as a professional (Tok, 2012) [22]. The more positive and enthusiastic teachers are about teaching, the more likely their pupils will be enthusiastic about learning. Development of positive attitude towards profession helps in developing creative thinking and motivating pupils (Celikoz & Cetin, 2014) [9]. What teachers like or dislikes, appreciate and how they feel about their job, the learners they teach could have a significant effect on their learners (Yara & Otieno, 2010) [23]

Teachers are generally responsible for maintaining and developing subject knowledge and understanding, reflecting on their own practice, taking active responsibility for their own continuing professional development and participating in the school's procedures for performance management. The issue of teachers as factor that affect pupils' academic achievement has received a lot of attention in the literature and findings of some research work which have been inconclusive. A strand of the literature revealed that a number of teacher variables such as years of teaching experience, level of educational attainment or academic qualifications, teacher development programmes, availability of qualified teachers, teacher-student ratio, teacher attitude, degree of job satisfaction, motivation and salary affect pupils learning outcomes (Akinsolu, 2010; Akpo, 2012; Daso, 2013; Ewetan, 2010; Odiri, 2011) [5, 10]. Another strand of the literature found that a number of teacher variables which include teacher years of experience, teacher academic attainment or qualifications, teacher-pupil ratio, and teacher development programmes had no significant influence on pupils' academic achievement (Ayodele & Ige, 2012; Yara & Surumo, 2012) [24].

One's pursuit of education and the actual magnitude of their academic achievement depend on several factors, many of which are collectively referred to as correlates of academic achievement. This paper is designed to investigate two of such correlates, school quality (class size) and teacher's characteristics (attitude towards teaching) with a view to identifying their relationship with pupil's academic achievement in Mathematics as measured by their grades attained in internal examinations from 2014/15 academic session to 2017/18 academic sessions. Against this backdrop therefore, this study sought to determine school quality and teachers' characteristics as correlates of pupils' academic achievement in mathematics in Nkanu West Local Government Area of Enugu State

Statement of the Problem

The academic achievement of pupils in primary school in Mathematics has been an issue of concern to all stakeholders in education. This is evident in the rate of mass failure of pupils in both internal and external examinations in Mathematics. Freiberg, Driscoll and Knights (1999) [12] observed that some of the notable factors that may influence academic achievement are; school climate, instructional

materials, discipline, physical facilities, teacher quality, type of location of school, class size. Another one is over population of pupils in classroom as being responsible for poor academic achievement of pupils. The researchers have observed with dismay that the school environment in public schools in Nkanu West Local Government Area of Enugu State is nothing to write home about. The class size is not interesting and conducive for teaching and learning. Competent teachers and instructional materials as well as infrastructural facilities are not available in some of the primary schools in the study area. It is on this premise that the researchers were motivated to determine the relationship between school quality and teacher's characteristics on pupils' academic achievement in Mathematics in Nkanu West Local Government Area of Enugu State.

Purpose of the Study

The main purpose of this study is to determine school quality and teachers' characteristics as correlates of pupils' academic achievement in mathematics in Nkanu West Local Government Area of Enugu State. Specifically, the study sought to:

1. Determine the relationship between class size and primary school pupils' academic achievement in Mathematics in Nkanu West Local Government Area of Enugu State.
2. Determine the relationship between teachers' attitude towards teaching and primary school pupils' academic achievement in Mathematics in in Nkanu West Local Government Area of Enugu State.

Research Questions

The following research questions guided the study

1. What is the relationship between class size and primary school pupils' academic achievement in Mathematics in Nkanu West Local Government Area of Enugu State?
2. What is the relationship between teachers' attitude towards teaching and primary school pupils' academic achievement in Mathematics in in Nkanu West Local Government Area of Enugu State?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance

1. There is no significant relationship between class size and primary school pupils' academic achievement in Mathematics in Nkanu West Local Government Area of Enugu State.
2. There is no significant relationship between teachers' attitude towards teaching and primary school pupils' academic achievement in Mathematics in in Nkanu West Local Government Area of Enugu State.

Method

The study aims to determine school quality and teachers' characteristics as correlates of pupils' academic achievement in mathematics in Nkanu West Local Government Area of Enugu State. Two research questions and two hypotheses guided the study. This study adopted a Correlational research design. The population of the study comprised of 665 public primary school teachers in the 54 public primary schools in Nkanu West Local Government Area. Using simple random sampling technique of balloting without replacement, 100 teachers were selected as the sample for the study. 10 schools were sampled from the 54 public primary schools in the area and from each school, 10 teachers were selected. The researchers developed a 15 item questionnaires which contains two instruments titled "Class Size Questionnaire (CSQ) and Teachers Attitude towards Teaching Questionnaire (TATQ) and primary five pupils overall academic achievement in mathematics in internal examination from 2014/15 academic session to 2017/18 sessions were used to collect data for the study. The instruments were validated by three experts; two from Childhood Education and one from Measurement and Evaluation all from the Department of Educational Foundation, University of Nigeria, Nsukka. Cronbach Alpha was used to measure the internal consistency and co-efficient of 0.92 and 0.79 were obtained with an overall co-efficient of 0.85 for the two clusters of the instrument. A four-point rating scale of Strongly Agree (SA-4 points), Agree (A-3 points), Disagree (D-2 points) and Strongly Disagree (SD-1 point) was used to answer the research questions. The data collected were analyzed using Pearson Product Correlation Coefficient to answer the research questions and also used in testing the hypotheses at 0.05 level of significant. In answering the research questions, value of 2.50 and above was regarded as agreed while the value below 2.50 was regarded as disagreed. In testing the hypotheses, any hypothesis with p-value lesser than 0.05 9 ($p< 0.05$) was rejected while a hypothesis with p-value greater than 0.05 was accepted using a description of High correlation $\pm$ 0.70 – 1.00, Moderate correlation $\pm$ 0.30 – 0.69 and Low correlation $\pm$ 0.00 – 0.29.

Results

Research Question 1: What is the relationship between class size and primary school pupils' academic achievement in Mathematics in Nkanu West Local Government Area of Enugu State?

Table 1: Correlational Analysis between Class size and Pupils Academic Achievement in Mathematics

Variables	Pearson Correlation coefficient (*r*)
Class Size	
	0.806
Pupils' Academic Achievement	

Table 1 above shows Pearson coefficient (r) of 0.806 which indicates that there is a positive and high relationship between class size and primary school pupils' academic achievement in Mathematics in Nkanu West Local Government Area of Enugu State.

Hypothesis 1: There is no significant relationship between class size and primary school pupils' academic achievement in Mathematics in Nkanu West Local Government Area of Enugu State**.**

Table 2: Correlation Coefficient of the Relationship between Class Size and Pupils' Academic Achievement in Mathematics

Variables	*R*	p-value	Remark
Class Size	0.806	0.000	S
Pupils' Academic Achievement			

S – Significant correlation at 0.05 level of significance

The two variables were significantly correlated, ($r_{(100)}$ =

0.806, df = p < 0.05) as shown in Table 2 above. Thus, it could be concluded that the relationship between class size and primary school pupils' academic achievement in Mathematics in Nkanu West Local Government Area of Enugu State is significant and the null hypothesis was rejected. Therefore, there is significant relationship between class size and pupils' academic achievement in the study area.

Research Question 2: What is the relationship between teachers' attitude towards teaching and primary school pupils' academic achievement in Mathematics in in Nkanu West Local Government Area of Enugu State?

Table 3: Correlational Analysis between Teachers' Attitude and Pupils' Academic Achievement in Mathematics

Variables	Pearson Correlation coefficient (*r*)
Teachers' Attitude	
	0.774
Pupils' Academic Achievement	

Data in Table 3 above shows Pearson coefficient (r) of 0.774 which indicates that there is a positive and high relationship between teachers' attitude towards teaching and primary school pupils' academic achievement in Mathematics in Nkanu West Local Government Area of Enugu State.

Hypothesis Two: There is no significant relationship between teachers' attitude towards teaching and pupils' learning outcome in Mathematics in primary schools in Nkanu West Local Government Area of Enugu State.

Table 4: Correlation Coefficient of the Relationship between Teachers' Attitude towards Teaching and Pupils' Academic Achievement in Mathematics.

Variables	*R*	p-value	Remark
Teacher Attitude	0.774	0.003	S
Pupils' Academic Achievement			

S – Significant correlation at 0.05 level of significance

The two variables were significantly correlated, ($r_{(100)}$ = 0.774, DF = p < 0.05) as shown by Table 4. Thus, it could be concluded that the relationship between teachers' attitude towards teaching and primary school pupils' academic achievement in Mathematics in Nkanu West Local Government Area of Enugu State is significant and the null hypothesis was rejected. Therefore, there is a relationship between teacher's attitude towards teaching and pupils' academic achievement in mathematics in the area.

Discussion

Findings in Table 1 revealed that there was a positive and high relationship between class size and primary school pupils' academic achievement in Mathematics in Nkanu West Local Government Area of Enugu State. This study tallies with that of Zurawsky (2013) [25], who posits that class-size have significant relationship with student's academic performance in examination. Also, the findings are in consonance with that of Muraina and Muraina (2014) [18], who posits that there was positive relationship between class size and students' scholastic achievement. Similarly, this finding is in congruent with Adu and Olatundun (2017) [2], who states that there is a gap in the quality of students in crowded classrooms. This means that class size influence the level of primary school pupils' academic achievement in Mathematics. The study also disclosed that a significant relationship exists between class size and primary school pupils' academic achievement in Mathematics in Nkanu West Local Government Area of Enugu State.

Findings in Table 2 revealed that there was a positive and high relationship between teachers' attitude towards teaching and primary school pupils' academic achievement in Mathematics in Nkanu West Local Government Area of Enugu State. The findings of this study was in consonance with Adesoji and Olatunbosun (2008) [3], who posits that student academic achievement was related to teachers' attitude towards the teaching profession. Also, the findings of this study was in line with that of Wirth and Perkins (2013), who posits that teacher's attitude contributed positively to student attention in the classroom. The study also revealed that a significant relationship exists between teachers' attitude towards teaching and primary school pupils' academic achievement in Mathematics in Nkanu West Local Government Area of Enugu State. A teacher's attitude is associated with his or her quality of teaching and learning in the classroom because a teacher who poses a negative attitude impairs the ability of pupils to be able to receive sound instructional messages on mathematics leading to wrong interpretation of concepts. This implies that primary school Mathematics teachers' attitude towards teaching affect their pupils' attitude to learning and achievement in the subject.

Conclusion

Teachers and learners are important subset of the educational system, and the interaction between them goes a long way in improving pupils' academic achievement and learning outcomes. This implies that school environment has to provide a stimulating teaching and learning setting that will promote teacher-pupils' engagement in Mathematics. Based on the findings of the study, it was concluded that class size and teachers' attitude towards teaching have significant relationship on pupils' academic achievement in Mathematics in Nkanu West Local Government Area of Enugu State.

Recommendations

Based on the findings, the following recommendations were made:

1. Enugu State Government in conjunction with Parent Teachers Association (PTA) should provide adequate and functional school facilities such as classroom in primary schools in order to stimulate teaching and learning environment that is capable of facilitating good academic achievement of pupils in Mathematics.
2. State Government should recruit more mathematics teachers in order to tackle the problem of large class-size for effective teaching and learning.
3. School administrators and state government should come up with incentive packages such as increasing teacher's salary in order to enable teachers developed positive attitude towards teaching in primary schools.

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