

CLASSROOM ROUTINE ACTIVITIES AS PREDICTORS OF STUDENTS' ACADEMIC ACHIEVEMENT IN MATHEMATICS IN CALABAR METROPOLIS OF CROSS RIVER STATE, NIGERIA.

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Abstract

This study examined the classroom routine activities as the predictors of students' academic achievement in Mathematics in Calabar Metropolis of Cross River State, Nigeria. Two hypotheses were formulated to direct the study. Ex-post facto research design was adopted for the study. A total sample of 500 Senior Secondary Class two (SS2) students out of 9,086 students was selected from 24 secondary schools for the study using stratified and proportionate simple random sampling procedures. The instruments used for data collection were Mathematics achievement tests, classroom attendance register and Mathematics teachers' assignment performance record books for assessing mathematics achievement, classroom attendance and mathematics assignment performance respectively. The reliability estimate of the mathematics achievement test established through Kuder Richardson formula K-R20 was .77, this met the criterion for stability and suitable for the study. Simple Linear Regression was the statistical technique adopted to test the hypotheses at .05 level of significance. The result of the analysis revealed that classroom assignment, classroom attendance significantly predicts students' academic achievement in Mathematics in this study population. Based on these findings, it was recommended that students should be given classroom assignment daily and that teachers should be encouraged to supervise, mark, score, grade and correct students' assignment. Also policies and measures which are aimed at increasing

student's attendances including making attendance compulsory need to be considered to enhances students' academic achievement in Mathematics.

Keywords: Classroom assignment, Classroom attendance, Mathematics achievement, Classroom routine activities



Introduction

Mathematics is compulsory for every student in both primary and secondary schools. Great emphasis has been placed upon the learning of mathematics because of its utility to the individuals and as well as to the nation at large. Despite the importance accorded to mathematics, students' performance in the subject in Nigeria remains generally poor. According to Adebule (2009) and Ologunwa (2012), students performed poorly at both internal and external examinations and the performance of students in mathematics at the end of secondary school education has not improved in the past decade. The achievement of students has been a great concern to educators, teachers, parents and government. Routine classroom activities might play invaluable role in helping students to develop the good learning skills and help them to perform better in examinations.

Classroom routine activities are those actions or roles performed by student within the classroom as they apply themselves to instructions given by the teacher including the practical part of the lesson that precede or follow the theoretical aspects of lessons presented by the teacher. Classroom routines activities help students feel more at ease with the daily activities of the classroom and give them a sense of knowing what to expect when they walk in the door each morning. Routines provide a structure that can aid in keeping children on task throughout the day, and they give teachers control over their students. Classroom routine become especially important when students are transitioning from one activity to another, either within a classroom or between classrooms.

Routines also help to create smoother transitions between activities and therefore allow fewer opportunities for disruptions to occur (Burden, 2003; Docking, 2002). In

addition, when students are expected to complete classroom routine tasks, they have the opportunity to learn greater responsibility and more self-management, hence, enhances performance in schools (Colvin & Lazar, 1995; Savage, 1999). Routines that require interaction between teacher and student (or among students) also serve to positively reinforce interpersonal communication and social skills and are one way for teachers to judge the quantity and quality of students' skills in these areas (Colvin & Lazar, 1995). Finally, student-performed routines free the teacher to focus on more effective instruction and on the unexpected events that come up throughout the school day (Savage, 1999).

Once the routine tasks are identified, teachers should establish clear, discrete procedures for handling routine events that are simple, easy for students to understand, and quick for them to perform (Savage, 1999). Classroom routines activities vary according to the teacher's goals, by grade level, and students' ability to exercise control of their behavior (Burden, 2003; Colvin & Lazar, 1995; Savage, 1999). Classroom routines help to established norms, set expectations, and otherwise build positive relationships in the classroom environment. It can increase student confidence and comfort levels since learners know what is expected of them in different situations (Burden, 2003). The classroom routine activities selected to assessment in the current study are classroom assignment and classroom attendance.

The importance of classroom assignments cannot be over emphasized for it has received many positive appraisals as to its positive effect on students' academic performance at all levels of education. Classroom assignment and studying serve an important purpose in enhancing good performance of students in mathematics.

Classroom assignment is not just a work assigned to students to keep them occupied at school; rather, it serves several educational purposes that are essential to receiving a complete education and improve students' performance in their academics. It provides an ample opportunity for students to develop self-discipline, study habit and time management. Classroom assignment refers to exercises or tasks assigned to students by their teachers to be completed within or outside the class. It is an extension or elaboration of classroom work.

According to Oluwaiyemi (2010) and Gadermann., Guhn, and Zumbo (2012), the objectives of classroom assignment to students are "to increase the knowledge and improve the abilities and capabilities of students, reinforce what students have already learnt, prepares them for incoming lessons and extremely what they know by having them applying it to new situations" Ganiyu, (2012). in their work on causes of students' poor performance in mathematics examination commented on the importance of mathematics assignments, they explain that understanding the fact that mathematics is not just a compulsory but also a mandatory subject, makes the performance of students in the examination of mathematics and issue of utmost importance to teachers lecturers, counselors and other individuals in the educational sector. Sule(2016) examined the effects of assignment and class size on students' academic achievement in mathematics in some selected secondary schools in Ogbadigbo Local Government Area of Benue State Nigeria and found students exposed to regular assignment performed better than those not exposed. In the similar way, Olufemi(2014) investigated the effect of classroom assignment on Mathematics achievement of Secondary School Students in South West Nigeria and found a significant difference between the achievement of students exposed to homework assignment and those not exposed to homework assignment.

Mathematics as a subject that emphasizes problem- solving and acquisition numeric skills, requires the learner to be actively engaged in classroom assignments

given to him by the teacher. Bishop (2008) opined that classroom assignment can also teach students to concentrate, write reports, spend time alone and develop a curiosity to be a continuous learner. Chen (2009) believes that actively engaging in classroom assignments encourages students to be advocates of their own learning. The purpose of mathematics assignment is typically to provide practice for the student. A meta-analyses conducted by Cooper, Robinson, and Patall, (2006). shows generally positive or neutral effects for classroom assignment on learning . Effects due to classroom assignment are more positive in middle and high school than elementary school (reflecting greater student maturity) and particularly for mathematics, which requires substantial individual practice (Eren & Henderson, 2011).

Studies conducted by FernándezAlonso, Suárez-Álvarez, and Muñiz, (2015); Galloway and Pope, (2007) supported the view that classroom assignment increases learning. According to studies conducted by Bergan, Sladeczek, Schwarz, and Smith, (1991), frequent use of formative assessments can improve achievement, particularly when the results are used to adjust instruction. Ojo and Oyewole, (2019) in their study to investigate the effectiveness of home assignment on the academic performance of secondary school students in mathematics in Ado-Ekiti LGA of Ekiti State, Nigeria using a sample 195 students and 20 teachers were randomly selected from ten (10) senior secondary schools found no significant difference in the performance of the students before and after giving of home assignment.

Effective teaching and learning can only take place when teacher and student attend to the school on a regular basis. Regular attendance helps a student to prepare for the examination through class discussion. Therefore, they can achieve higher exam scores. Hence higher academic performance will be achieved. Spaho and Godolja (2014) stated that when students attend consistently in school they are more likely to be successful. Alija, (2013)examined the relationship between class attendance and academic performance

and found that class attendance has significant and positive impact on academic performance. Therefore, he recommend mandatory class attendance policy for enhancing academic performance. Jacob (2009) stated that irregular students in school face learning problems, inability to read and fear consulting with teachers. Findings from the reviewed studies indicate that when students attend their classes on a regular basis, they are more likely to obtain higher exam scores.

By using the Pearson correlation coefficient analysis on a sample of 2,680 students of secondary school students in Delta regions of the North, Central and South, Oghuvbu (2010) investigated the correlation between attendance and academic performance and found that students' attendance was positively and significantly related with academic performance. In an analysis of the causal effect of class attendance on the student performance Caviglia-harris, (2006.) also found significant and substantial effect of attendance on the academic performance.

According to Purcell (2007) and Hirby and McElroy (2003) the class attendance and engagement of students plays a vital role in the education's system. Several previous studies have shown that class attendance is a crucial indicator of academic performance. Hence the higher the attendance the higher the final grades achieved by the students. Lim and Chapman (2013) stated that regular attendance has influence on the examination performance. One interesting findings of this study is that regular attendance is more important for female students than male students, since female students who earned above average grade were more likely to have attended classes than female students who is earned below average grade; but for male students no such difference was found.

Masingham, and Herrington,(2006) investigated link between attendance and overall grade of 346 students where they concluded that attendance does matter for academic performance. The study also found that very low attendance has negatively significant impact on the examination performance. Rodgers (2001) in his study with

a sample of 167 students in the statistic course observed that attendance has statistically significant effect on the performance of the students. Hirby and McElory (2003) examine the determinants of the levels of attendances at classes and relationship with academic performance with a sample of 368 first-years economics students. The study indicated that part-time occupations with excessive hours of work, travel time are the main determinants of class attendance, which in turn has negative effect on the grade point. Moreover, Ngurah, and Lynch, (2013).found significant positive relationship between class attendance and exam performance. According to the research conducted in Kuwait by Maloney, and Lally, (1998) suggested that attendance was among the basic factors which increased student achievement in learning settings. Sydney (2016) found that the students who were chronically absent from their Kindergarten school had lower exam performance than their peers. Another study conducted by Donka, (2009) found that attendance was positively and significantly related to students' academic performance in Louisiana's public elementary and secondary school.

The connection between class attendance and student learning has received considerable attention, and a clear and positive relationship between class attendance and course grades has been established. In a meta-analysis based on 69 classes Credé, Roch, and Kieszczynka (2010) conclude that class attendance is the most accurate known predictor of academic achievement. In a recent synthesis of meta-analyses, paralleling the work of Hattie (2008) in school education, Ganiyu, (2012) ranked 105 variables that are related to achievement in higher education, and rated class attendance number six among these. Purcell (2007) has observed a relationship between the attendance during the classes and students' performance achieved at the end of the school year. Carol, and Kanyongo (2012). have also found a strong positive correlation between school attendance and academic performance.

Research questions

The following research questions were posed

- i). How does classroom assignment predict academic achievement of students' in Mathematics?
- ii). How does classroom attendance predict academic achievement of students' in Mathematics?

Hypotheses

The following null hypotheses were formulated to guide the study.

- i). Classroom assignment does not significantly predict academic achievement of students' in Mathematics
- ii). Classroom attendance does not significantly predict academic achievement of students' in Mathematics

Methodology

The study area was Calabar Metropolis of Cross River 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 classroom assignment and classroom attendance were variables that have occurred already and the researcher had no direct control over them. The population for the study consisted of all the senior secondary school 2 (SS 2) students in Calabar Metropolis which comprises of Calabar South and Calabar Municipality Local Government Areas (LGAs). There are 24 public secondary schools and 9,086 SS-2 students which comprises of 4098 male and 4988 female students. A multi-stage sampling technique involving stratified, proportionate and simple random technique was adopted in selecting 500 SS-2 students, comprising 209 males and 291 females for the study. The students were stratified based on schools, gender and local government areas. Out of a total of 24 public secondary schools, 12(50%) of schools were randomly selected for the study, from the selected schools in each local government, 5.5% of the total number of students were selected using proportional sampling technique giving a total sample of 500 SS 2 students for the study.

The instruments used for data collection included Mathematics achievement tests for assessing students' academic achievement in Mathematics; School register/classroom attendance register for students classroom attendance; and Mathematics teachers' assignment performance record books for students classroom assignment. Mathematics achievement tests was made up of 30 items constructed by the researcher with help of two experts in Mathematics education.

The items were constructed based on SS 2 Mathematics syllabus with four option A,B,C,D. A correct answer attract one (1) Mark while incorrect answer attract zero (0) mark. The instrument was face-validated by two experts in Measurement and Evaluation and two Mathematics Educators, both from the University of Calabar. Corrections were pointed out by the experts and adjusted by the researchers and the document was considered valid. The reliability estimate of the Students' Mathematics achievement test was established through Kuder Richardson formula K-R20 which gave .77. For School register/classroom attendance register used for students classroom attendance was obtained and Mathematics teachers' assignment performance record books used for students classroom assignment were obtained from Mathematics teachers, the average attendance and average performance in classroom assignment was determined and entered for individual students for their corresponding classroom attendance score and classroom performance school. The statistics package for social sciences (SPSS) computer programme was used to analyze the data collected. The hypotheses were tested using Simple Linear Regression Analysis for the two hypotheses of the study.

Results

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

Hypothesis one: Classroom assignment does not significantly predict academic achievement of students' in Mathematics. The independent variable in this hypothesis is classroom assignment while the dependent variable is students' academic achievement in Mathematics. To test this hypothesis, relationship of Mathematics performance

record on classroom assignment and students' score on academic achievement of students' in Mathematics performance was assessed using Simple Linear regression.

The F-ratio test was used to test for the significance of the overall prediction model, while t-test was used to test for the significance of the contribution of the regression constant and coefficient (which represents the predictive power of the independent variable) in the prediction model. The results are presented in Table 1.

Table 1: Regression analysis of classroom assignment as predictors of academic achievement of students' in Mathematics.

| Variables | X | SD |
|-------------------------|---------|---------------------------|
| Classroom assignment | 12.2740 | 2.24968 |
| Mathematics achievement | 23.4760 | 5.40155 |
| R-value = .745 | | Adjusted R-squared = .554 |
| R-squared = .555 | | Standard error = 4.94019 |

| Source of variation | Sum of squares | Df | Mean square | F-value | R-value |
|---------------------|----------------|-----|-------------|----------|---------|
| Regression | 15182.762 | 1 | 15182.762 | 622.104* | .000 |
| Residual | 12153.950 | 498 | 24.406 | | |
| Total | 27336.712 | 499 | | | |

| Predictor variable | Unstandardized coefficient B | Std. error | Std. coeff | t-value | p-value |
|----------------------|------------------------------|------------|------------|---------|---------|
| Constant | 105.638 | 2.103 | | 50.233* | .000 |
| Classroom assignment | 2.452 | .098 | .745 | 24.942* | .000 |

- Significant at .05 level. P < .05

The results in Table 1 show that the R-value of .745 was obtained, resulting in an R-squared value of .555 This means that the variation of classroom assignment accounted for about 55.5 % of the total variation in academic achievement of students in Mathematics . The p-value (.000) associated with the computed F-value (622.104) was less than .05. As a result, the null hypothesis was rejected. This means that classroom assignment significantly influence academic achievement of students in Mathematics, with both the regression constant

(105.638) and coefficient (2.452) contributing significantly in the prediction model (t= 50.233& 24.942 respectively, p=.000 & .000 < .05). The prediction equation may therefore be written as:

$$y = 105.638 - 2.452x$$

where,

y = Mathematics achievement

x = Classroom assignment

Hypothesis two: Classroom attendance does not significantly predicts academic achievement of students' in Mathematics. The independent variable in this hypothesis is classroom attendance while the dependent variable is students' academic achievement in Mathematics. To test this hypothesis, relationship of Mathematics performance record on classroom attendance and students' score on academic achievement of students' in

Mathematics performance was assessed using Simple Linear regression. The F-ratio test was used to test for the significance of the overall prediction model, while t-test was used to test for the significance of the contribution of the regression constant and coefficient (which represents the predictive power of the independent variable) in the prediction model. The results are presented in Table 2.

Table 2: Regression analysis of classroom attendance as predictors of academic achievement of students' in Mathematics.

| Variables | X | SD | | | |
|-------------------------|------------------------------|---------------------------|-------------|---------|---------|
| Classroom attendance | 13.5320 | 2.52145 | | | |
| Mathematics achievement | 23.4760 | 5.40155 | | | |
| R-value = .392 | | Adjusted R-squared = .152 | | | |
| R-squared = .154 | | Standard error = 6.81497 | | | |
| Source of variation | Sum of squares | Df | Mean square | F-value | R-value |
| Regression | 4207.710 | 1 | 4207.710 | 90.598* | .000 |
| Residual | 23129.002 | 498 | 46.444 | | |
| Total | 27336.712 | 499 | | | |
| Predictor variable | Unstandardized coefficient B | Std.error | Std.coeff | t-value | p-value |
| Constant | 78.273 | 2.623 | | 29.841* | .000 |
| Classroom attendance | -1.152 | .121 | .392 | -9.518* | .000 |

*Significant at .05 level. $P < .05$

The results in Table 2 shows that the R-value of .392 was obtained, resulting in an R-squared value of .154. This means that the variation of classroom attendance accounted for about 15.4 % of the total variation in academic achievement in Mathematics. The p-value (.000) associated with the computed F-value (90.598) was less than .05. As a result, the null hypothesis was rejected. This means that classroom attendance significantly influence students' academic achievement in mathematics, with both the regression constant (78.273) and coefficient (-1.152) contributing significantly in the prediction model ($t = 29.841$ & -9.518 respectively, $p = .000$ & $.000 <$

.05). The prediction equation may therefore be written as:

$$y = 78.273 - 1.152x$$

where,

y = Mathematics achievement

x = Classroom attendance

Discussion

The result of the first hypothesis revealed that classroom assignment does significantly predict academic achievement of students' in Mathematics. According to Oluwaiyemi (2010) and Gadermann., Guhn, and Zumbo (2012), the objectives of classroom assignment to

students are “to increase the knowledge and improve the abilities and capabilities of students, reinforce what students have already learnt, prepares them for incoming lessons and extremely what they know by having them applying it to new situations” The finding is in agreement with the finding of Sule (2016) who examined the effects of assignment and class size on students' academic achievement in mathematics in some selected secondary schools in Ogbadigbo Local Government Area of Benue State Nigeria and found students exposed to regular assignment performed better than those not exposed. In the similar way, Olufemi(2014) investigated the effect of classroom assignment on Mathematics achievement of Secondary School Students in South West Nigeria and found a significant difference between the achievement of students exposed to homework assignment and those not exposed to homework assignment. Chen (2009) believes that actively engaging in classroom assignments encourages students to be advocates of their own learning. The purpose of mathematics assignment is typically to provide practice for the student. A meta-analyses conducted by Cooper, Robinson, and Patall, (2006). shows generally positive or neutral effects for classroom assignment on learning Studies conducted by FernándezAlonso, Suárez-Álvarez, and Muñiz, (2015); Galloway and Pope, (2007) supported that classroom assignment increases learning. According to the studies conducted by Bergan, Sladeczek, Schwarz, and Smith, (1991), frequent use of formative assessments can improve achievement, particularly when the results are used to adjust instruction.

The result of the second hypothesis revealed that hypothesis shows that Classroom attendance significantly predicts academic achievement of students' in Mathematics. This is in consonance with Spaho and Godolja (2014) who stated that when students attend consistently in school, they are more likely to be successful. Therefore, attendance in school is very important. The finding is in line with the study conducted by Alija, (2013) who examined the relationship between class attendance and academic performance and

found that class attendance has significant and positive impact on academic performance. Therefore, he recommend mandatory class attendance policy for enhancing academic performance. In the same way, Oghuvbu (2010) investigated the correlation between attendance and academic performance and found that students' attendance was positively and significantly related with academic performance. In an analysis of the causal effect of class attendance on the student performance Caviglia-harris, (2006.) also found significant and substantial effect of attendance on the academic performance.

According to Purcell (2007) and Hirby and McElroy (2003) the class attendance and engagement of students plays a vital role in the education's system. Lim and Chapman (2013) stated that regular attendance has influence on the examination performance. Masingham, and Herrington,(2006) investigated link between attendee and overall grade of 346 students where they concluded that attendance does matter for academic performance. The study also found that very low attendance has negatively significant impact on the examination performance. Rodgers (2001) in his study with a sample of 167 students in the statistic course observed that attendance has statistically significant effect on the performance of the students.. Moreover, Ngurah, and Lynch, (2013) found significant positive relationship between class attendance and examination performance. Research conducted in Kuwait by Maloney, and Lally,(1998) suggested that attendance is one of the basic factors which increase student achievement in learning settings. Sydney (2016) found that the students who were chronically absent from their Kindergarten school showed lower exam performance than their peers. Another study ies conducted by Donka, (2009) found that attendance was positively and significantly related to students' academic performance in Louisiana's public elementary and secondary school. Carol and Kanyongo (2012) found a strong positive correlation between the attendance and the academic performance. The connection between class attendance on student learning

has received considerable attention, and a clear and positive relationship between class attendance and course grades has been established. In a meta-analysis based on 69 classes Credé, Roch, and Kieszczynka (2010) conclude that class attendance is the most accurate known predictor of academic achievement.

Conclusion

Mathematics is the substratum on which the technological advancement of today is built. It is a very useful tool which helps in achieving the objectives in other subjects. Therefore it is very important to identify factors that can help students to improve their abilities and make progress in the subject of mathematics. Based on the finding of this study, it could be concluded that classroom assignment and classroom attendance are indeed necessary and essential for enhancement of academic performance. Therefore, classroom assignment and classroom attendance are very important factors and should be promoted as effective strategies for enhancing the academic performance of students in Mathematics.

Recommendations

Based on the finding of the study, the following were recommended

- i. Students should be given regular classroom assignments, and teachers should be encouraged to supervise, mark, score, grade and correct students' assignment. This will help to enhance students' academic achievement in Mathematics.
- ii. Also as a result of this study, it is recommended that schools authorities, teachers and other stake holders should promote initiative aimed at increasing student's attendances to improve students' performance in school.

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