Assessment of Utilization of Educational Facilities on Junior Secondary School Students' Academic Achievement in Mathematics in Kwara State, Nigeria

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Abstract: - **This study investigates Assessment of Utilization of Educational Facilities on junior secondary school students' academic achievement in Mathematics in Kwara State, Nigeria. To give direction to the study, three research questions and hypotheses were posed. The study adopted the ex-post facto design with a population of six thousand four hundred and ten (6,410) respondents drawn from 15 schools drawn from the sixteen Local government areas in the three geopolitical zone in Kwara state A questionnaire developed by the researchers titled "Utilization of Educational Facilities Questionnaire (UEFQ) was used for the study. The second instrument was Mathematics Achievement Test (MAT) The instrument consisted twenty one (21) objective test questions on Mathematics, based on junior secondary one, two and three (JSS 2 & 3) syllabus. construct validity of the instruments were established by three experts, one in measurement and evaluation and two in Mathematics education and Educational Management respectively from University of Calabar and Kwara State university respectively and the reliability was established with Cronbach alpha reliability index which ranged from .70 to .86 respectively. The data gathered were analyzed with one-way Analysis of Variance (One-way ANOVA). The major findings revealed that most of the secondary schools in North, Central and Southern Kwara. Also it was found that schools that have these facilities poorly utilize even the available ones and these contributed to the students' poor academic achievement in Mathematics. It was recommended that: Government, in collaboration with the school management, should make fund available for procuring modern electronic instructional resources to complement the conventional non print resources.**

Keywords: **Assessment, Utilization, Educational Facilities, Academic Achievement Mathematics.**

I. INTRODUCTION

In every educational setting, there is a need to promote efficient utilisation of both human and material resources for enhanced learning. Learning is the act of impacting knowledge, skills, and ideas to the learner which will lead to permanent change in behaviour of the individual in the society. For students to effectively learn there must be adequate educational facilities to enhance learning. To make learning interesting the teacher has to make effective use of educational facilities. Educational facilities refer to all the facilities that we can find in the school environment, both human and non-human resources. Olagboye (2004) considers educational facilities to mean instructional resources such as library, laboratory, social facilities which are properly selected and used during teaching and learning process these facilities help to consolidate learning into the learner's mind and help the learner to recall things that would have been easily forgotten.

The use of educational facilities is very crucial in improving the overall quality of the learning experiences. Effective utilization of educational facilities makes the learners employ most of their senses so as to make learning easier. Baribor (2003) noted that the use of educational facilities such as instructional materials is to aid the learner in his learning. The academic achievement of students in any educational system is very important. The society is always looking forward to seeing the end of every individual academic achievement in school. The academic achievement of students may be influenced for better if educational facilities are available and usable during teaching and learning process. The achievement of students' examination may depend to a large extend on the available learning facilities for the subject.

Elaturoti (2010) conducted a study to investigate the extent of utilisation of instructional resources and teachers' facilitation of skill based subjects on students' academic achievement in Mathematics in Canada. The study adopted the descriptive survey design. Two null hypotheses were formulated to guide the study using 6,647 teachers and 9,737 students as the population. 10% of the teachers and 20% of the students were selected using the stratified sampling technique in each of the education zone in Kwara state to give a total of six hundred and sixty five (665) teachers and one thousand three hundred (1300) students respectively. Two research instruments: "Instructional Resources and Teachers' Facilitation of Skilled Based Subject Questionnaire (IR&TFSBSQ) "and" Achievement in Mathematics Test (AAMT) were used. The Pearson Product Moment Correlation and Independent Chi-square statistics were used for data analysis. Results revealed a positive relationship

between instructional resources and teachers' facilitation of skilled based subject and the achievement of students in Mathematics kills.

Omengala (2009) conducted a study to determine the instructional materials availability in secondary schools for teaching of Mathematics in Kaduna state metropolis. the study also sought to determine the frequency of use of the said materials and the qualification of the teachers. The correlational design was adopted in the study. Four research questions and three hypotheses were formulated to guide the study. The instrument used for data collection was a structured questionnaire administered to 100 Mathematics in Chikun and Kaduna South Local Government Areas of Kaduna State. The mean equation and descriptive statistics were used to analyze the data. The results showed that the available instructional materials in our secondary schools are chalkboards, charts, pictures, maps, good books in the library, excursions, real objects, rock samples, field tools and apparatus. They had mean values of 2.6 to 4.0. School farm, pH meter, exhibits and models are not easily available in our Secondary Schools (mean value 1.9 to 2.3). The study revealed that chalkboard is very frequently used in teaching of Agricultural Science (mean value 3.9). Charts, exhibits, specimens, pictures, field tools, rock samples and apparatus are used frequently in teaching of agricultural science (mean value 2.4 to 2.8). Field trips, real objects, maps, school farms, library, pH meter are used occasionally in teaching (mean value 2.24 to 2.4). The teachers teaching Mathematics in the studied area are qualified (mean 3 to 4). They also have teaching qualification (62%). Most of the teachers (50%) read general agriculture and have been teaching the subject for about 10 years. The schools, government and nongovernmental organizations should help in providing the instructional materials that are lacking.

Ekundayo (2008) sought to examine the relationship between school facilities and students' achievement in the affective and psychomotor domains of learning. The study was a descriptive research design of the survey type. The population consisted of all the teachers in public secondary schools in south-west Nigeria. The sample was however made up of 1200 teachers from 60 secondary schools. Multistage, simple and stratified random sampling techniques were used to select the states, the schools and the teachers for the study. A self-structured instrument tagged "Secondary School Effectiveness Questionnaire (SSEQ)" which was validated by research experts in educational management and tests and measurement was used to collect the data for the study. The data collected were analysed using frequency counts, simple percentages, bar charts and Pearson product moment correlation. The study revealed that the schools' physical facilities were not all that adequate. The study further revealed that the students achieved well in the affective and psychomotor domains of learning. The study revealed that there was a significant relationship between school facilities and students' achievement in the affective domain as well as a significant relationship between school facilities and students' achievement in the psychomotor domain of learning. Based on the findings of the study, it was recommended that schools should sustain the tempo of students' achievement in the affective and the psychomotor domains, while government should improve upon the level of physical facilities in schools so as to improve the students' achievement in these areas of learning.

The school library is a room or building in a school where books, magazines, journals, periodicals, cassettes, computers among others are kept for students' use. In other words, it is the central laboratory of the whole school, where all books in all subject areas, taught in the school and non-book materials are stocked. Dike (2001) sees school library as a learning laboratory par-excellence where learners find the world of knowledge, interact directly with resources, acquire information and develop research skill for lifelong learning. The objective of the school library is to serve the school's need and to make possible the purpose and methods of education which the school undertakes. Voss (2000.146) emphasizing on the importance of laboratory states that" laboratory experiences provide knowledge of specimen or phenomenon or illustrations of basic principles as verification of facts." High quality laboratory programs are capable of eliciting thinking skills, technical skills and motivation necessary to produce a well prepared group of scientists, engineers and citizens to meet the scientific and environmental challenges of today and the future.

Ainon and Rosmaizura (2018) conducted a study on the Impact of Facilities (library) on Student's Academic Achievement. The study adopted the correlational design with four hypotheses stated Data were distributed to 500 students of 2016/17 academic calendar. A total of 364 returned and usable questionnaires were received, given a response rate of about 73%. The study runs correlation and regression analysis to analyse the data. The results of the study show that E-learning of System Management; Teaching Aids and Library of Learning Environment; Hostels, Sports Facilities and Parking and Transportation of Infrastructure were all significant to impact students' academic achievement. All the factors contributed about 51.5% towards the students' achievement. As this is the first attempt of looking at the issue in the UMK, it provides valuable findings of the factors which should be given attentions by UMK and other academic institutions to improve students' academic achievement.

Ogunniyi (2003) conducted a study to find out how the influence of library facilities on students academic achievement in Mathematics in Ogun state. Two research questions and hypotheses were developed. To achieve this objective, interview guide and questionnaire were used to elicit the views of respondents. In all, 454 Mathematics students were involved in the study. The simple random, cluster and convenient sampling techniques were used to select the respondents for the study. Frequency counts and percentages were used as statistical tools for analyzing the

questionnaire data collected, and the data from the interview guide was transcribed, categorized, analyzed and discussed on themes and subthemes that emerged. The findings revealed that majority of the respondents do not utilize the library facilities to enhance their achievement in Mathematics. It is on the basis of this backdrop that the study was carried to assess utilization of educational facilities on junior secondary school students' academic achievement in Mathematics in Kwara State, Nigeria.

Statement of the problem

The poor academic achievement of students in Mathematics has been a cause for concern to stake holders in the academic environment. This is because Mathematics is one of the core subjects being taught in all levels of education in Nigeria. Personal interaction with most students revealed that the teaching of Mathematics has not been properly done as they feel that most of the teachers handling the subject have little or no basic knowledge concerning the subject couple with poor utilisation of facilities like library, laboratory, effective use of instructional media and so forth. This has also posed problems to the students who have the quest for learning the subject. Obviously result has shown an astonishing low level of Junior Secondary School Students academic achievement in junior WAEC in Mathematics. From 2015 to 2019 achievement of junior secondary school students in Mathematics in Kwara State has left much to be desired. Efforts so far made at improving this seemingly bad situation by Kwara state Government does not seems to provide the desired result. It would appear from past efforts that the problems have not been either correctly diagnosed or solutions provided have not been adequate enough to ameliorate the situation.

Result provided by the Ministry of Education, Kwara State Education Authority indicates geometric increases in the percentages of failure from of students of JSS three in Mathematics from 2015 to 2019. The result showed that in 2015, the percentage of failure was 50.11%, in 2016 it rose to 61.18%,in 20117 it increased to 69.45%, in 2018 , the was also an increase to 68.11 and in 2019 the failure rate increased to 79.06% accordingly. It is worrisome to note that if students at this level continue to perform below expectation, it is daunting to cripple the educational quest of all students in the nearest future. This underscores the need for embarking on the present study. Therefore, the problem of this study is: To what extent are educational facilities utilized on academic achievement in Mathematics of Junior Secondary School Students' in Kwara State, Nigeria?

Research Questions

The following research questions were formulated for this study

1. To what extent does the utilization of instructional materials influence students' academic achievement in Mathematics?

2. What is the influence of the utilization of library facilities on students' academic achievement in Mathematics?

Statement of Hypotheses

To achieve the purpose of this study, the following null hypotheses were formulated:

1. There is no significant influence of utilization of instructional materials on students ' academic achievement in Mathematics.
2. There is no significant influence of utilization of library facilities on students' academic achievement in Mathematics.

II. RESEARCH METHODOLOGY

The research design adopted for this study was ex-post facto design. Ali (2006), described ex-post facto design as a means of undertaking studies in which the independent variables among the subjects already exist and cannot be manipulated or controlled. Thus, both the independent and dependent variable were studied in retrospective. The population for this study consist all junior secondary two and three (JSS 2 & 3) students' in public and private secondary schools in the sixteen Local Government Area in Kwara State. According to the State Secondary Education Board, Kwara State, (SSEB 2015), there are 16, 897 students in Junior Secondary two and three (JSS 2 & 3). The stratified and simple random sampling techniques were adopted in the study which was employed to select a sample size of 658 students from the targeted population represents 10% of the population of students in the zone.

Two instruments were used for data collection in this study namely; 'Utilization of Educational Facilities Questionnaire (UEFQ). In developing the instrument, six items were developed to measure each of the variations of utilisation of instructional materials, and utilisation of library facilities. The questionnaire was divided into two (2) sections, section A was designed to collect the respondents personal data such as name of school and sex of the students .Section B contains eighteen (18) Items with 4 point scale of highly Available (H.A), moderately Available (M.A), Lowly Available (L.A), and Not Available (N.A).

The second Instrument was on Mathematics Achievement Test (MAT) The instrument consist of 21 objective questions on Mathematics, based on junior secondary two and three (JSS 2 & 3) syllabus. A table of specification was used as a guide in setting the question. To ascertain the extent to which the items in the instrument measures what it was designed to measure. Two kinds of validity were established, which is content and construct validity was ascertained by giving the instruments to three experts two in Measurement and Evaluation and one in Educational Management. Their suggestion and modifications by these experts were then incorporated in the final copy before administration. Also a table of specification (test blue

print) was constructed by the researcher to help guide in the items constructions this is presented in Table 4.

The table of specification (test blue print) guided the researchers in the construction of the academic achievement test in Mathematics. In order to ascertain the reliability of the instrument a trial testing was carried out with 40 students who are part of the population, but will not be used in the final study. The reliability was established using Cronbach alpha reliability of internal consistency after the administration the reliability was calculated and the index ranged from 0.79 to 0.94 accordingly, this is presented in Table 1.

TABLE 1

Reliability analysis for the research instrument (N=40)

VARIABLE	K	$\sum S_1^2$	SX^2	$\ddot{X}$	SD	∞
Utilization of instructional materials	6	1.32	3.87	21.26	3.00	.79
Utilization of library facilities	6	1.42	4.01	19.67	2.11	.88
Academic achievement in Mathematics	21	1.30	3.98	22.32	3.10	.94

Key: K=total number of items, $\sum S_1^2$=sum of item variance, SX^2 = item variance.

SD = Standard Deviation and ∞=reliability coefficient with Cronbach Alpha

III. RESULTS AND DISCUSSION

The major independent variable in this study is utilisation of educational facilities which has the following categories; utilisation of instructional materials, utilisation of library facilities and utilisation of social facilities. The dependent variable in the study is academic achievement in Mathematics. The results of the data collected is presented hypothesis-by-hypothesis as shown below.

Hypothesis one: There is no significant influence of the utilization of instructional materials on students ' academic achievement in Mathematics. The independent variable in this hypothesis is utilization of instructional materials which has three level chalk board, charts and maps. The dependent variable is academic achievement in Mathematics which was measured continuously. To test this hypothesis One-Way ANOVA was employed as presented in Table 2.

TABLE 2

Result of One-way Analysis of Variance with the influence of utilization of instructional materials and academic performance in Mathematics

Levels of utilization of instructional materials			N	$\overline{X}$	SD
Chalks boards			312	16.62	3.61
Charts			175	15.83	3.55
Maps			171	14.81	3.56
Total			658	15.75	3.57
Sources of variance	Sum of squares	df	Mean square	F- ratio	p-value
Between Group	103.521	2	51.76		
				11.04	.018
With Groups	8442.73	656	12.87		
Total	8546.24	658			

*p<.05

TABLE 3

Post-hoc comparison with Fisher's Least Significance Different (LSD) on utilization of instructional materials on achievement in Mathematics

Utilization of instructional materials	N	High	Moderate	Low
Chalks boards	312	16.62	.72	1.81*
Charts	175	1.89	15.83	1.02*
Maps	171	3.00	4.76	14.81
		MSW=12.87		

**<.05, critical t = 1.960, df = 656. a = Group means are placed along the diagonal. b = Difference between group means are placed above diagonal. c = Fisher LSD are placed below the diagonal

It is obvious from the result in Table 2 that the descriptive statistic using 658 students with the levels of utilization of instructional facilities (chalkboard, charts and maps) has 312 for chalkboard, 175 for charts and 171 for maps respectively. Their means of 16.62, 15.83 and 14.81 with a corresponding standard deviation was found to be 3.61, 3.55 and 3.56. The inferential statistical analysis with One-way Analysis of variance showed that the p-value was found to be 018 which is less than the chosen alpha of .05 thus the null hypothesis is rejected. This implied that there is a significant influence of the utilization of instructional materials on students ' academic achievement in Mathematics. To confirm the direction of means differences, a post-hoc was performed with Fisher's Least Significant Difference (LSD) to show the mean differences among groups as presented in Table 3.

The Fisher's Least Significant Difference (LSD) in Table 3, show that the mean differences for chalk board and charts has no statistical mean difference (t=1.89; p=.071, $\overline{X}$=.72). For chalk board and maps the mean difference is statistically significance as (t=3.00; p=.019, $\overline{X}$=1.81), while for chats and maps the mean differ significantly as (t=-4.76; p=.000, $\overline{X}$=1.02). The result indicate that there is no mean differences for chalk board and charts, while there is a significant man differences for chalk board and maps and moderate and low.

Hypothesis two: There is no significant influence of the utilization of library facilities on students' academic achievement in Mathematics. The independent variable in this hypothesis is utilization of library facilities which has three level viz textbooks, magazine and computers. The dependent variable is academic achievement in Mathematics which was measured continuously. To test this hypothesis One-Way ANOVA was employed as presented in Table 4.

TABLE 4

Results of One-way Analysis of Variance with the influence of utilization of library facilities

Utilization of library facilities			N	$\overline{X}$	SD
Text books			201	15.98	2.01
Magazines			267	14.00	3.91
Computers			190	13.71	3.64
Total			658	14.56	3.19
Sources of variance	Sum of squares	df	Mean square	F- ratio	p-value.
Between Group	128.43	2	64.22		
				10.21	.001
With Groups	8876.02	656	15.74		
Total	9004.45	658			

*p<.05

TABLE 5

Post-hoc comparison with Fisher's Least Significance Different (LSD) on utilization of library facilities

Levels of utilization of library facilities	N	High	Moderate	Low
Text books	201	15.98	1.98*	2.27*
Magazines	267	3.08	14.00	.29
Computers	13.56	4.09	1.05	13.71
		MSW=15.74		

p**<.**05, critical t = 1.960, df = 656. a = Group means are placed along the diagonal. b = Difference between group means are placed above diagonal c = Fisher LSD are placed below the diagonal

Table 4 showed that the total respondents that constitute the sample are 658 with the three levels of utilisation of library materials categorized as (text books, magazines and computers). test books has 201; magazines has 267 and computers 190 respondents with their mean values of 15.98, 14.00 and 13.71 accordingly. Their respective standard deviation was found to be 2.01, 3.91 and 3.64, the inferential statistical analysis (One-way Analysis of variance) showed that the p-value of .001 as found to be less than the chosen alpha of .05. Therefore, the null hypothesis is rejected. This implies that there is a significant influence of utilisation of library facilities on students' academic achievement in Mathematics. To carry out a comparative analysis of the mean differences, a Post- hoc mean comparison was executed with

Fisher's Least Significant Difference (LSD) and the result is presented in Table 5.

With Fisher's Least Significant Difference (LSD) in Table 5, for Post-hoc mean comparison the result shows that text books and magazines has a statistical mean differences as (t=.3.08; p=.000, $\overline{X}$=.1.98). For text books and computers that there is a statistical mean differences between this two categories as (t=4.09; p=.005, $\overline{X}$= .29), while for magazines and computers shows that there is no statistical difference in their group means as (t=-13.71; p=1.05, $\overline{X}$=.29). This implied that the mean differences lies in the category of text books and magazines, text books and computers and magazines and computers respectively.

Discussions of Findings

Utilization of instructional materials and students academic achievement in Mathematics

The findings revealed that there is a significant influence of utilization of instructional materials on academic achievement of students in Mathematics. the present study agrees with that by Elaturoti (2010) whose results revealed a positive relationship between instructional resources and teachers' facilitation of skilled based subject and the achievement of students in mathematics kills.

In the same vein, Omengala (2009) study revealed that chalkboard is very frequently used in teaching of Agricultural Science (mean value 3.9). Charts, exhibits, specimens, pictures, field tools, rock samples and apparatus are used frequently in teaching of agricultural science (mean value 2.4 to 2.8). Field trips, real objects, maps, school farms, library, pH meter are used occasionally in teaching (mean value 2.24 to 2.4). The teachers teaching Mathematics in the studied area are qualified (mean 3 to 4). They also have teaching qualification (62%). Most of the teachers (50%) read general agriculture and have been teaching the subject for about 10 years. The schools, government and nongovernmental organizations should help in providing the instructional materials that are lacking.

Finally, study by Ekundayo (2008) affirmed with the finding of the present study as it revealed that the schools' physical facilities were not all that adequate. The study further revealed that the students achieved well in the affective and psychomotor domains of learning. The study revealed that there was a significant relationship between school facilities and students' achievement in the affective domain as well as a significant relationship between school facilities and students' achievement in the psychomotor domain of learning. Based on the findings of the study, it was recommended that schools should sustain the tempo of students' achievement in the affective and the psychomotor domains, while government should improve upon the level of physical facilities in schools so as to improve the students' achievement in these areas of learning.

Utilization of library facilities and academic achievement of students achievement in Mathematics

The study revealed that library utilisation has a significant influence on students' academic achievement in Mathematics. this implies that the extent of library usage can influence the students performance. the present study s in consonance with that by Ainon and Rosmaizura (2018) results of the study show that E-learning of System Management; Teaching Aids and Library contributed about 51.5% towards the students' achievement. As this is the first attempt of looking at the issue in the UMK, it provides valuable findings of the factors which should be given attentions by UMK and other academic institutions to improve students' academic achievement. Also, Ogunniyi (2003) the findings revealed that majority of the respondents do not utilize the library facilities to enhance their achievement in Mathematics.

IV. CONCLUSION

It can be concluded, based on the finding of the study, that utilisation of educational facilities such as instructional and library facilities are very important factor that determines the level of academic achievement of students in secondary school subjects, particularly in Mathematics at the secondary school levels in Kwara State. The school library media resources are required not only by students but also teachers who can be regarded as the facilitators of interactive communication through which curriculum instructions in Mathematics are carried out. It can also be concluded that provision of school library media resources will be inadequate for instructions in Mathematics if electronic or non-print forms of media resources are lacking from the list of available resources. The non-utilisation of school library media centres and requisite school library media resources can promote students academic achievement in Mathematics.

V. RECOMMENDATIONS

The following recommendations, based on the findings of the study, are hereby made:

1. Government should encourage the establishment of standard school library media centres in all the primary schools.
2. School library media professionals and specialists should be employed to manage the school library media centres.
3. The teaching/learning process of subjects, particularly Mathematics should revolve round the school social facilities and resources. This is because learning is about reality and any pupil who interacts frequently with learning and instructional materials is likely to perform better.

Policy Implication of the findings on Research and Management

The result of this study is expected to benefit

researchers and educational managers/administrators in that it is hoped to establish the relationship between utilization of school facilities to enhanced effective research delivery for enhanced performance in school. One of the greatest challenge posed by research in Nigeria in availability and poor utilisation of educational facilities. The findings of the study is hoped to equipping the government and ministry of education with the necessary information that will enable them to provide and utilised educational facilities to enhance better academic performance of students. The findings assist teachers will tailor their teachings towards using appropriate school facilities to enhance better learning and better academic performance.

The finding is hoped to assist educational administrators and policy makers on the harm poor utilization of available facilities can do to educational system, this is hoped to serve as an encouragement to principals and other school administrators to seek means of effective utilization of existing school facilities so as to improve teaching and learning as well as pupils' academic performance.

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