



Research Paper

An investigation into the benefits of using activity - oriented teaching techniques and strategies to teach Mathematics in lower primary schools in Sierra Leone. (A Case Study of four primary schools in Kenema City, Sierra Leone)

Mohamed Alpha^{a1}, Lahai Koroma^b

^a Department of Mathematics, Eastern Technical University of Sierra Leone

^b Department of Environment Sciences, Eastern Technical University of Sierra Leone

ARTICLE INFO	ABSTRACT
<p>Received: 03 March 2022</p> <p>Reviewed: 17 March 2022</p> <p>Revised: 04 April 2022</p> <p>Accepted: 08 April 2022</p> <p>Keywords: <i>Methodology; Questionnaires; interview schedules; teaching and learning materials; percentage</i></p>	<p>An investigation into the benefits of using activity - oriented teaching techniques and strategies to teach Mathematics in lower primary schools has been carried out in Sierra Leone. Four (4) primary schools in the Kenema City were selected for the research work; College Practicing School, Methodist Primary School, The Door International Academy Primary School and St. Paul's Primary School. The variations in the characteristics in each of the schools selected were meant to provide balanced information and avoid biasness in the data collection process. 160 of class four pupils (40 from each of the Schools) and their Mathematics Teachers were selected for this research work. Stratified Sampling and Simple Random Sampling (SRS) methods were used to select pupils. Questionnaires and interview schedules were carefully designed to solicit information with regard to the appropriate teaching methodology that could be used to teach mathematics in lower primary schools. The results obtained were analyzed in a simplified manner using tables and calculating percentages. It was concluded in this research work that activity method is the best methodology to be used to teach mathematics in the lower primary schools and that the School Authorities should endeavour to make available the necessary teaching and learning materials for the effective teaching of mathematics.</p>

¹ Corresponding Author
medjalpha@gmail.com

1. Introduction

This research work was geared towards investigating the benefits of using activity - oriented teaching techniques and strategies to teach Mathematics in primary schools in Sierra Leone. Pupils encounter a lot of problems during the teaching and learning of mathematics in Primary schools in Sierra Leone. The lack of trained and qualified mathematics teachers, appropriate teaching methodology, Resource materials and training manuals are among the major challenges affecting the teaching and learning of mathematics in Sierra Leone. A lot of research works have been carried out in terms of the appropriate teaching methodology to be used in the primary schools in order to make the teaching and learning of mathematics effective

Mathematics has been reported to be "the branch of human enquiry involving the study of numbers, quantities, data, shape and space and their relationships, especially their generalizations and abstractions and their application to situations in the real world" (Clapham & Nicholson, 2014) Mathematicians generalize new formulas or methods based on similar patterns for different branches of mathematics (Devlin & Parkin, 2004). Research work on teaching methods and their application in different branches of mathematics taught at secondary level in Pakistan has been carried out. The following Teaching methods of mathematics; lecture, inductive, deductive, heuristic or discovery, analytic, synthetic, problem solving, laboratory and project methods were identified as the various methods used by teachers at secondary level in Pakistan (Baiq, 2015; Rosenshine & Stevens, 1983; Cornelius, 1982; Bhat et al., 2019; Marpa, 2021). It was concluded that Teachers adopt any method according to the specific unit of syllabus, available resources and number of students in a class³. In another related research work, it was reported that teachers keep the motivational level of students high otherwise they lose interest in mathematics (Mirzaxolmatovna & Ibrokhimovich, 2022).

It has been reported that pupil's poor performance in mathematics was based on the teaching methods, lack of practice by pupils and high pupils-teacher ratio (Agarwal et al., 2021). Another research work reported investigated the teaching methods used by the teachers in teaching pupils with low mathematical skills in Tanzania. They introduced an effective intervention for enhancing pupils' achievement levels in mathematics. The problem of low mathematical skills was caused by unsuitable teaching and learning environment, few teaching methods, negative attitude of pupils and parents towards mathematics, shortage of teaching and learning materials and negative interaction between teachers and pupils (Michael , 2013; Allsopp et al., 2007; Sjöberg et al., 2018).

2. Research Methodology

The research was conducted in Kenema City, Nongowa chiefdom, Eastern Region of Sierra Leone. The following four (4) primary schools in the city were selected for the research work;

- *College Practicing School*
- *Methodist Primary School*
- *The Door International Academy Primary School*
- *St. Paul's Primary School*

The selection took into consideration a number of parameters including Boys school and co-education Schools. The variations in the characteristics in each of the schools selected were meant to provide balanced information and avoid biasness in the data collection process.

160 pupils (40 from each of the Schools) and the Mathematics Teachers of Classes 4 were selected. Stratified Sampling and Simple Random Sampling (SRS) methods were used to select pupils in Class four (4) from each of the schools.

Questionnaires and interview schedules were carefully designed to solicit information with regard to the level of understanding of mathematics and teaching methodology used.

3. Results and Discussions

The results obtained from the questionnaires obtained from the pupils and from the interview of the mathematics teachers are were collected, analyzed and presented in the following tables below.

Table 1. Showing Educational level of Teachers is the selected schools

Teacher Qualification	No. of Respondents	Percentage
T.C	10	37%
H.T.C	8	29.6%
H.N.D	7	25.9%
B.Ed.	2	7.4%
TOTAL	27	100%

Source: Computation from data collected, 2022

The above data clearly shows the respondents teaching qualifications. It further reveals all the respondents have at least attained including the Teachers Certificate (TC), Higher Teachers Certificate (HTC), Higher National Diploma (HND) and Bachelor of Education Degree (B.Ed.). From the table above one can deduce that one hundred percent (100%) of respondents have formal education background.

Table 2. Showing Pupils Interest in Mathematics in the Primary Four of each the Schools selected in Kenema

SCHOOL	No. of Pupils	Like	Dislike
College Practicing School	40(25%)	12(7.5%)	28(17.5%)
Methodist Primary School	40(25%)	14(8.8%)	26(16.2%)
The Door Primary School	40(25%)	12(7.5%)	28(17.5%)
St. Paul's Primary School	40(25%)	13(8.1%)	27(16.9%)
Total	160(100%)	51(31.9%)	109(68.1%)

Source: Computation from data collected, 2022

From the table above, out of 100% of pupils under investigation 31.9% like Mathematics, 68.1% of them dislike Mathematics for all the Schools. 7.5% like mathematics 17.5% dislike mathematics in the college Practice School; Methodist Primary School 8.8% like Mathematics while 16.2% dislike Mathematics; Door International Academy Primary School 7.5% like and 17.5% dislike Mathematics and St. Paul's Primary School 8.1% like Mathematics while 16.9% of pupils dislike Mathematics.

Table 3. Showing the Teacher –Pupil Ratio in Four Primary School in Primary Four in each of the Schools

No	School	Class	Pupils	Teachers
1	College Practicing School	IV ^{A,B,C}	135	4
2	Methodist Primary School	IV ^{B,G,R & Y}	326	10
3	The Door International Academy Primary School	Standard IV ^{A&B}	110	6
4	St. Paul's Primary School	IV ^{A,B,& C}	248	7
	TOTAL	11	819	27

Source: Data collected 2022

The above table shows that the distributions of pupils in class per teacher are above the ideal classroom situations. This clearly shows that the number of pupils per class in the selected schools is greater than what is recommended for effective teaching and learning of Mathematics.

Table 4. Showing the Subject Specialization of the mathematics of the mathematics teachers in each of the Schools selected.

Special subject	No. of respondents	Percentage
Mathematics major	08	29.7%
Integrated Science	07	25.9%
Home Science	04	14.8%
Physical and Health Education	04	14.8%
Agriculture	04	14.8%
TOTAL	27	100%

Source: Data collected 2022

From the table above, 29% of the respondents specialized in Mathematics, 25.9% in Integrated Science, 14.8% in Home Economics, 14.8% in Physical Health Education and 14.8% in Agriculture. From the mere look of the table above it clearly tells us that about 70.3% of respondents claimed the responsibility to teach Mathematics even though they are not Mathematics specialist.

Table 5. Showing the quantity of Teaching/ Learning Materials in Schools

No	School	Adequate	Inadequate	Total
1	College Practicing School	1	3	4(15%)
2	Methodist Primary School	3	7	10(37%)
3	The Door International Academy Primary School	1	5	6(22%)
4	St. Paul's Primary School	1	6	7(26%)
	TOTAL	6(22%)	21(78%)	27(100%)

Source: Data collected 2022

The table above indicated that 78% of the respondents do not have adequate teaching/learning materials in their various schools. The lack adequate teaching and learning materials in the schools hinders effective delivery by teachers and the active participation of pupils. 22% responded that they had adequate teaching and learning materials.

Table 6. Showing the Teachers response to the Methodology suitable for teaching mathematics at Primary Schools.

No	School	Lecture	Demonstration	Activity	Project	Total
1	College Practicing School	1	1	2	--	4(15%)
2	Methodist Primary School	2	1	7	--	10(37%)
3	The Door International Academy Primary School	2	--	4	--	6(22%)
4	St. Paul's Primary School	1	1	4	1	7(26%)
	TOTAL	6(22%)	3(11%)	17(63%)	1(4%)	27(100%)

63% of the mathematics teachers responded that the activity method, 22% lecture method, 11% demonstration method and 4% project method for the appropriate teaching methodology suitable for teaching mathematics at lower primary schools

Table 7. Showing the Pupils response to the Methodology suitable for teaching Mathematics at Primary Schools.

No	School	Lecture	Demonstration	Activity	Project	Total
1	College Practicing School	7	6	23	4	40(25%)
2	Methodist Primary School	8	5	25	2	40(25%)
3	The Door International Academy Primary School	7	4	28	1	40(25%)
4	St. Paul's Primary School	10	2	26	2	40(25%)
	TOTAL	32(20%)	17(10.6%)	102(63.8%)	9(5.6%)	160(100%)

Table (7) indicates that 63.8% of the pupils like the activity method, 20% lecture method, 10.6% demonstration method and 5.6% project method as the appropriate teaching methodology for better understanding of mathematics at lower primary schools.

4. Conclusion and Recommendation

An investigation into the benefits of using activity - oriented teaching techniques and strategies to teach Mathematics in lower primary schools has been carried out in Sierra Leone. Four (4) primary schools in the Kenema City were selected for the research work; College Practicing School, Methodist Primary School, The Door International Academy Primary School and St. Paul's Primary School. The selection of pupils for the research work took into consideration a number of parameters including Boys school and co-education Schools. The variations in the characteristics in each of the schools selected were meant to provide balanced information and avoid biasness in the data collection process. 160 classes' four pupils (40 from each of the Schools) and their Mathematics Teachers were selected. Stratified Sampling and Simple Random Sampling (SRS) methods were used to select pupils.

Questionnaires and interview schedules were carefully designed to solicit information with regard to the appropriate teaching methodology that could be used to teach mathematics in lower primary schools.

The results indicated that all the classes' four teachers were trained and qualified but only 29% of the respondents were specialized in Mathematics, 25.9% in Integrated Science, 14.8% in Home Economics, 14.8% in Physical Health Education and 14.8% in Agriculture. This showed that 70.3% of Mathematics teachers in the schools selected were not qualified to teach mathematics in the lower primary schools.

31.9% of the pupils like Mathematics, 68.1% of them dislike Mathematics for all the Schools investigated with 7.5% like mathematics 17.5% dislike mathematics in the college Practice School; Methodist Primary School 8.8% like Mathematics while 16.2% dislike Mathematics; Door International Academy Primary School 7.5% like and 17.5% dislike Mathematics and St. Paul's Primary School 8.1% like Mathematics while 16.9% of pupils dislike Mathematics.

The pupil – teacher ratio was appropriate in each of the schools selected but 78% of the schools do not have adequate teaching/learning materials. The lack adequate teaching and learning materials in the schools hinders effective delivery by teachers and the active participation of pupils. In terms of the Teaching Methodology, 63% of the mathematics teachers responded that the Activity Method, 22% Lecture Method, 11% Demonstration Method or 4% Project Method was the appropriate teaching methodology suitable for teaching mathematics at lower primary schools.

The responses from the pupils indicated that 63.8% of the pupils like the activity method, 20% lecture method, 10.6% demonstration method and 5.6% project method as the appropriate teaching methodology for better understanding of mathematics at lower primary schools.

It is concluded in this research work that activity method is the best methodology to be used to teach mathematics in the lower primary schools and that the School Authorities should endeavour to make available the necessary teaching and learning materials for the effective teaching of mathematics

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