

Challenges of Teaching Mathematics: A Perspective of Teachers on Training under Teacher Upgrade Programme, in Kano State, Nigeria

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Abstract

The study investigated some of the Challenges of Teaching Mathematics: Perspective of Teachers on Training under Teacher Upgrade Programme, Kano State College of Education and Preliminary Studies, Nigeria. The study adopted descriptive survey design and utilizes questionnaire as an instrument for data collection. To guide the conduct of the study, two research questions were formulated. The population of the study consists of all students of the programme from which a sample of 59 were randomly selected (the central limit theory suggests a minimum of 30 samples can be used for a study). Fifty nine (59) questionnaires were administered from which 50 were returned to the researcher for analysis. The research data were analysed using SPSS and descriptive statistics particularly frequency and percentages was employed. The findings of the study showed that the most potent of the factors challenging teaching mathematics are- inadequate instructional materials with 43 (86%) agreement, wrong use of teaching method, unqualified mathematics teachers teaching mathematics, lack of participation from the students due to lack of understanding, lack of planning by the teachers with 40 (80%), 41 (82%), 43 (86%) and 45 (90%) of agreement respectively. The study concluded that teaching and learning of mathematics have many challenges and the topmost are inadequate instructional materials, wrong use of teaching method by mathematics teachers, unqualified mathematics teachers teaching mathematics, lack of participation from the students due to lack of understanding and lack of proper planning by the teachers. The study recommends among others that for a successful mathematics lesson, adequate preparations and provisions for whatever is necessary has to be made. Mathematics being a core subject, there must be adequate provisions for the prerequisites of teaching it successfully.

Keywords: *Teaching, Learning, Mathematics, Challenges, Instructional Materials*

Introduction

With all the huge benefits and importance of mathematics, many challenges can be said to have surrounded mathematics education in Nigeria. Researchers the world over have identified the various challenges of teaching mathematics in the various studies undertaken. The problems differ in terms of location and technological advancements and with respect to the level of a country being developed, developing or under developed. Notable among

the researchers are (Ali, 2013) who identified inadequate mathematics teachers, poor teaching methods, students' attitude and interest and unqualified teachers as the chronic factors. (Sa'ad, Adamu and Sadiq, 2014) concluded that students' negative attitude towards mathematics, anxiety, fear of mathematics, inadequate qualified teachers, poor teaching method and inadequate teaching materials and overcrowded classrooms are some of the causes of mathematics poor performance among students. (Sumaila and Abdu, 2017) concluded that of the listed factors in the data collection instruments, lack of interest from the students in the subject of mathematics has the highest response rate.

National Council of Teachers of Mathematics (NCTM, 2000) outlines some broad goals thus: teachers need several different kinds of mathematical knowledge –

- i) knowledge about the whole domain,
- ii) deep flexible knowledge about curriculum goals and about the important ideas that are central to their grade level,
- iii) knowledge about how the ideas can be represented to teach them effectively and
- iv) knowledge about how students' understanding can be assessed.

The report of the National Council of Teachers of Mathematics NCTM (2000) provides evidence of alignment between students' learning experiences and their teachers' teaching practices. The report points out that:

Students learn mathematics through the experiences that teachers provide. Thus, students' understanding of mathematics, their ability to use it to solve problems, and their confidence in, and disposition toward, mathematics are all shaped by the teaching they encounter in school. The improvement of mathematics education for all students requires effective mathematics teaching in all classrooms (p. 17).

Kurnik (2008) states that students should gradually and appropriately be taught how to analyze, synthesize, abstract, induce, deduce, generalize, specialize and observe analogies, regardless of whether they will be seriously involved in math at a later stage. The final implementer of a curriculum inside the classroom is the teacher as such (Turnuklu and Yesildere 2007) stated that teachers play an important role in the teaching and learning process and the way s(he) communicates his/her ideas and viewpoints to students influences how the individual student learns. This is as suggested by (Miller, 2009) that connecting mathematics to real-world contexts gives teachers the opportunity of making mathematics seem more accessible and enjoyable to learners.

Teacher Upgrade and access Acceleration programme (TUPAC) is a programme designed to upgrade teachers from holding other certificate (Ordinary National Diploma, National Diploma and other Diplomas with or without Education) to holders of the Nigeria Certificate in Education. In the same vein, the primary school teachers that did not obtain admissible requirement are being refreshed to attain the status. The intake into the programme are those kind of candidates that have less than three credits in their O' level and those that obtained Diploma in other fields or the teachers employed to teach but do

not have the minimum teaching qualification (NCE certificate). Kano State College of Education and Preliminary Studies is one of the centres running the program and the samples of this study were drawn from there.

Statement of the Problem

The place of mathematics in the national curriculum and the provisions contained in it informs that the subject must be taught well. Teaching mathematics is a task that needs to be accomplished no matter what, for, its applications in other fields of study are numerous. To teach mathematics, the teacher requires content knowledge and pedagogical knowledge and in some cases either content knowledge or pedagogical knowledge. There is the necessity of utilization of instructional materials where necessary and to be handled by those trained in the field. However, looking at what obtains in most of the secondary schools and including some other public schools, one can say that there is need to find out what is really happening as per the teaching of mathematics. The outcome of the final Senior Secondary School Certificate Examination result of mathematics is continuously being not encouraging leading to people's outcry on the performance. This study intends to investigate the challenges being faced by mathematics teachers in the teaching and learning that led to the poor performance in the subject bearing in mind the relevance and utmost importance attached to it.

Objectives of the Study

The objectives of this study are to:-

- 1) Identify the factors causing poor delivery of mathematics contents through lessons in classrooms to students
- 2) Explore the enormous factors that are the most potent and require quick address to change the scenario.

Research Questions

To guide the conduct of the study, the following research questions were asked.

- 1) What are the factors that caused poor delivery of mathematics lessons in classrooms?
- 2) Which among the factors that are the most potent and require quick address to change the scenario?

Methodology

The research design adopted for this study was a descriptive survey. The population of the study consists of all students that were enrolled for the teacher upgrade and access acceleration programme of the college. The sample of the study involves 59 students drawn from the population (according to central limit theory 30 samples can be enough for a study). The sampling procedure employed was a simple random sampling technique. The data for the study were collected through the administration of questionnaire as the research instrument. The research instrument was an open ended questionnaire in which the samples

were asked to tick the response that corresponds with what obtains and a total of 50 were returned.

Data Presentation

The respective data collected from the study are presented in Tables 1 – 3.

Demographic Data

Table 1: Distribution of Sample of the Study by Qualification

Qualification	Frequency	Percent	Cumulative Percent
Diploma in Math Educ	20	40.0	40.0
OND	17	34.0	74.0
Other Diploma	6	12.0	86.0
BSc	7	14.0	100.0
Total	50	100.0	

Table 1 presented the distribution of the sample of the study by qualification. From Table 1, 17 (34%) are holders of Ordinary Diploma certificate, 13 (26%) hold either other Diploma or BSc certificate while 20 (40%) are holders of Diploma in Mathematics Education certificate which by default have the qualification to teach as having the pedagogical and content knowledge.

Table 2: Distribution of Sample by Area of Specialisation

Area of Specialization	Frequency	Percent	
		t	Cumulative Percent
Mathematics Education	20	40.0	40.0
Mathematics	7	14.0	54.0
Others	23	46.0	100.0
Total	50	100.0	100.0

Table 2 presented the distribution of the sample of the study by their area of specialization. From Table 2, twenty 20 (40%) are mathematics education specialists, seven 7 (14%) are mathematics only specialists and twenty three 23(46%) other specialists.

Research Question One: What are the factors that cause poor delivery of mathematics lessons

in classrooms?

The data needed to answer all the research question one are contained in Table 3.

Table 3: Summary of the Responses from the Sample

SN	IDENTIFIED PROBLEM	RESPONSE										
		SA	%	A	%	U	%	D	%	SD	%	Mis s

1	Inadequate Instructional Materials	24	4 8	1 9	3 8	-	-	4	8	-	-	3
2	Wrong use of Teaching Materials	14	2 8	2 6	5 2	2	4	2	4	4	1 6	2
3	Inadequate Teachers of Mathematics	21	4 2	1 8	3 6	2	4	2	4	2	4	5
4	Poor classroom management by the teachers of Mathematics	17	3 4	2 4	4 8	2	4	2	4	2	4	3
5	Lack of Qualified Mathematics Teachers	21	4 2	2 0	4 0	5	1 0	-	-	3	0 6	1
6	Lack of Creativity	19	3 8	2 1	4 2	4	0 8	1	2	2	4	3
7	Overcrowded Classrooms	18	3 6	1 7	3 4	5	1 0	4	8	2	4	3
8	Lack of Research by the Teachers	25	5 0	2 0	4 0	2	4	1	2	-	-	-
9	Non-prompt payment of salary	9	1 8	2 2	4 4	5	1 0	1 3	26	-	-	1
10	Lack of Discussion between pupil and teachers	6	1 2	2 2	4 4	6	2	8	16	2	4	1
11	Lack of participation by the pupils	11	2 2	3 2	6 4	5	1 0	-	-	2	4	-
12	Lack of Class Control	14	2 8	2 2	4 4	6	1 2	7	14	-	-	1
13	Lack of Supervision	12	2 4	2 1	4 2	9	1 8	8	16	-	-	-
14	Lack of relationship between parents and teachers	16	3 2	1 6	3 2	5	1 0	1 0	20	2	4	1
15	Lack of Money for field trip	8	1 6	8	1 6	1 1	2 2	1 1	22	8	1 6	-
16	Lack of Discipline by the Mathematics teachers	8	1 6	2 4	4 8	4	8	8	16	5	1 0	-
17	Inadequate Mathematics textbooks in schools	15	3 0	2 1	4 2	1	1	5	10	6	1 2	2
18	Lack of punishment	15	3 0	1 4	2 8	3	6	1 3	26	5	1 0	-
19	Low income of the teachers	13	2 6	1 7	3 4	4	8	1 1	22	5	1 0	-
20	Lack of planning by the teachers	16	3 2	2 9	5 8	1	2	2	4	2	4	-

Table 3 presented a summary of the responses from the sample of the study. From Table 3, 20 factors were listed as the challenges against quality teaching of mathematics to the students in the classroom. The factors were considered to be among the many that can be enumerated. Of all the listed factors in this study, only item 15 (Lack of Money for field trip) was not agreed by the respondents to be a piercing factor against quality lesson delivery. To this end, field trip play little or no role in determining students' performance in mathematics. The percentage of agreement with field trip is just 32% while that of disagreement with the factor is 40%. All the factors listed in the questionnaire are believed to be utmost capable of challenging to the teaching and learning of mathematics. The listed factors on a serious note served as bottlenecks to a successful lesson.

Research question two: Which among the factors are the most potent that require quick address

to change the scenario?

Table 3 provides the data for answering research question two. From Table 3, most potent of the factors challenging the teaching of mathematics are inadequate instructional materials with 43 (86%) agreement; wrong use of teaching method; unqualified mathematics teachers teaching mathematics; lack of participation from the students due to lack of understanding; lack of planning by the teachers with 40 (80%), 41 (82%), 43 (86%) and 45 (90%) of agreement respectively. Hence, the most potent of the factors that challenges the successful mathematics lesson are:- inadequate instructional materials, wrong use of teaching method, unqualified mathematics teachers teaching mathematics, lack of participation from the students due to lack of understanding, lack of planning by the teachers

Discussion

The study investigated the challenges of teaching mathematics: A perspective of teachers on training under Teacher Upgrade and access acceleration programme in Kano State College of Education and Preliminary Studies. The study employs survey design that utilizes administration of questionnaire as the data collection procedure. The data collected was analysed using a descriptive statistics specifically frequency and percentage.

The findings of this study showed that the most potent among the factors bedeviling the teaching and learning of mathematics are:-

- inadequate instructional materials
- wrong use of teaching method
- unqualified mathematics teachers teaching mathematics
- lack of participation from the students due to lack of understanding
- lack of planning by the teachers

From the list of the factors, some are teacher related, some are students related while others are authority related. From the findings, the teachers' related factors are wrong use of teaching method and lack of proper planning of the lesson. The findings support the earlier

works of STAN (2002), Sa'ad, Adamu and Sadiq (2014) and (Sumaila and Abdu, 2017) who found instructional materials, wrong teaching methods, students negative attitude towards mathematics and unqualified teachers to be the most itching challenges of teaching and learning mathematics. It is noteworthy that instructional materials play vital roles to a successful lesson but, could better be handled by a well trained mathematics teacher.

Conclusion

The study concluded that teaching and learning of mathematics have many challenges and the most potent of the challenges are:- inadequate instructional materials, wrong use of teaching method by mathematics teachers, unqualified mathematics teachers teaching mathematics, lack of participation from the students due to lack of understanding and lack of proper planning by the teachers.

Recommendations

The study investigated the challenges of teaching mathematics: A perspective of teachers on training under Teacher Upgrade and access acceleration programme in Kano State College of Education and Preliminary Studies. The study recommends that to bring the challenges to a bearable minimum, the followings need be observed :- The interest of the learner are of paramount importance as such, should be focused and retained before and during the teaching and learning processes; Teachers should be implored to the utilisation of relevant instructional materials. Doing this would motivate learners towards being attentive while in the classrooms; To upgrade the teachers knowledge, seminars and workshops need be organized and conducted at varying intervals to enrich and update teachers on new approaches to teaching mathematics; Qualified teachers (having content and pedagogical knowledge) should be employed to spearhead and promote the teaching and learning mathematics in secondary schools. Finally, mathematics teachers should be adequately motivated to improvise and use instructional materials. This can be done by improving condition of service for mathematics teachers.

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