International Journal of Educational Studies (INJEDS)
Vol. 4 Is. 1 (August 2025)
EISSN: 3092-8990
Website: https://www.injeds.com

IDENTIFIED PEDAGOGICAL ISSUES IN THE TEACHING AND LEARNING OF MATHEMATICS IN ABIA STATE

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Abstract

The purpose of this study was to examine the pedagogical issues in the teaching of Mathematics in Abia- State. It specifically identified the pedagogical issues of teaching Mathematics, the extent the pedagogical issues influence the teaching of Mathematics and suggested remedies of pedagogical issues identified. Three research questions guided the study. The study adopted a descriptive survey research design. A sample of 128 Mathematics teachers drawn from WAEC examiners of 2022 May/June examination were used for the study. Instrument used for data collection was researchers' structured questionnaire made up of 12 items. The instrument was developed by the researchers and named Questionnaire on Pedagogical Issues in Teaching of Mathematics (QPITM). Mean and standard deviation were used to answer research questions. Results indicated that there are pedagogical issues that were identified and that the pedagogical issues to a high extent have influence on the teaching of Mathematics. Recommendations were made that those issues that were identified should be taken care of by

both the government and teachers. Every teacher should improve his pedagogical content knowledge (PCK) as to be effective in the teaching of mathematics

Keywords: pedagogical issues, influence, teaching, learning, mathematics.

Introduction

Mathematics as a language of science is needed by all because of its wide applications. Mathematics helps to develop the ability to think, explains how things work, develops wisdom, increases the speed of instruction, makes a child smarter and provides the child with an opportunity to get to the world .Mathematics is an indispensable tool in virtually all human endeavours and there is hardly any field where mathematics is not useful (Uka, 2020).

The contributions of mathematics in the development of individuals and nation had made it a subject sought after. It is a core subject in primary and secondary schools in Nigeria, Mathematics is the subject of numbers, shapes, data, measurement and logical activities. It has a huge scope in life generally and every field of life such as medicine, engineering, finances, accounting among others. The usefulness of mathematics cannot be over emphasized as both the literate and non- literate need mathematics to operate in every area of life (Okigbo & Ejikeme , 2017).

The importance of Mathematics to National Development, had made it a core (compulsory) subject for all primary and secondary schools' students in Nigeria (FRN, 2014). Due to indispensable roles mathematics plays in the advancement of science and technology of any nation, it is made a pre-requisite for entry into the tertiary levels (Uka, 2020).

Despite the importance of mathematics to all facets of the world, students' performance in both internal and external examinations have not been encouraging. It has continued to be poor and this poor performance is attributed to many factors which could include teacher-based, students based and curriculum based (Ginga et al, 2019).

Teacher -based issues could be due to a lot of factors. These factors among others could include lack of knowledge of concept or lack of experience; teachers inability to relate concept to real life activities, deliberate skipping of some mathematics concepts by teachers, poor

environmental background, lack of funds to purchase textbooks and lack of good text books as well as lack of confidence among teachers during classes. Actually there are some topics which are perceived or identified as difficult by the students and some reasons why they are identified as difficult topics according to Owabe (2019) are that some teachers of mathematics do not have mathematical knowledge teaching (MKT). MKT comprises of subject matter knowledge (SMK) and pedagogical content knowledge (PCK). Pedagogical content knowledge (PCK) is divided into knowledge of content and students (KCS) which deals with the ability of teachers to choose and arrange suitable problems for the classroom, and knowledge of curriculum (KC) (Hurrel, 2013 ; Otun & Olaoye, 2019).

Pedagogy is the method and the practice of teaching and learning. It helps the teacher to conduct the teaching-learning activities more efficiently. Pedagogy of Mathematics means the science of teaching mathematics. It includes all the teaching strategies, methods, and the theory and practice of teaching, the specific interactions of teacher and students, and the instructive contents used.

An effective learning of mathematics at the school level depends on the various issues related to the teaching and learning process. It is an establish truth that effective pedagogy is the heart of teaching (Zaidi et al, 2019). According to Zaidi et al (2019), pedagogical issues in Mathematics which has influence on the teaching and learning of mathematics among others are: Misconception with mathematics, pedagogical knowledge of the teacher, listening to mathematics learner, multivariate nature of mistakes by learner, reflecting evaluation, linking with real life experiences.

Otun and Olaoye (2019) found that there is need to increase Mathematics content knowledge and mathematical pedagogical content knowledge of mathematics preservice teachers. The teacher should as well have knowledge of content.

"Content knowledge includes an understanding of what makes the learning of specific topics easy on the difficult conceptions and preconceptions that students of different ages and backgrounds bring with them to the learning of those most frequently taught topics and lessons" (Shulman in Otun & Olaoye, 2019 P 290).

. Pedagogical content knowledge (PCK) is the knowledge that is peculiar to teachers; their knowledge of teaching and the subject matter knowledge.

Purpose of the Study

The purpose of this study was to identify and examine the influence of pedagogical issues in the teaching of Mathematics in Abia State. Specifically it sought to

1. Identify the pedagogical issues of teaching Mathematics in Abia State
2. Find the extent the pedagogical issues influence the teaching of Mathematics in Abia-State
3. Find the remedies of pedagogical issues identified

Research Questions

The following research questions were formulated to guide the study

1. What are the identified pedagogical issues of teaching Mathematics in Abia State?
2. To what extent does the pedagogical issues influence the teaching of Mathematics?
3. What are the remedies to the pedagogical issues identified?
   1.

Methodology

The design for this study was survey. 350 mathematics teachers who attended the marking of 2022 West African Senior School Certificate Examinatiion (WASSCE) May/ June formed the population of the study. These teachers came from all the zones in Abia–State (Aba, Umuahia and Ohafia Zones). The sample consists of128 mathematics teachers that came for the marking at Holy Rosary College Umuahia, Abia State. . A structured questionnaire made up of 12 items was used as instrument for data collection. Each question has four options of Very high extent (VHE, 3.5- 4.00). High extent (HE, 3.49 – 2.5, Low extent (LE, 2.49 -2.0) and Very low extent (VLE, 1.99 -1.00). 128 copies of the questionnaire were distributed and same retrieved after

filling. The instrument was developed by the researchers and named Questionnaire on Pedagogical Issues in Teaching of Mathematics (QPITM). It consists of four (4) sections, A, B, C and D. Section A measured the demographic variables of the respondents. Section B consists of possible pedagogical issues associated with the teaching of mathematics which teachers were to use. Section C deals with the extent the pedagogical issues influenced the teaching of mathematics while Section D consists of possible remedies of the pedagogical issues identified. Mean and standard deviation were used to answer the research questions.

Results and Discussion

Research Question 1.

2. What are the identified Pedagogical issues of teaching Mathematics?

The teachers were able to identify the following as the pedagogical issues in the teaching of mathematics.

Table 1: Identified Pedagogical issues in the Teaching of Mathematics

S/N	Identified Pedagogical issues in the Teaching of Mathematics
1	Not having enough Knowledge
2	Lack of Seminars/workshops
3	Lack of good textbooks
4	Distractions from the environment
5	Lack of qualified teachers
6	Problem of syllabus coverage
7	Inadequate mathematics laboratory
8	Lack of facilities
9	Teachers' attitude to teaching
10	Not linking Mathematics with real life experience
11	Reflecting Evaluation Process
12	Misconceptions with Mathematics by students

The teachers were able to identify the pedagogical issues in their teaching of mathematics as listed in table 1 above.

Research Question 2

To what extent do the pedagogical issues influence the teaching of Mathematics?

Table 2: The Extent Pedagogical Issues Influence the teaching of Mathematics

S/N	ITEMS	MEAN	SD	DECISION
1	Not having enough knowledge	3.03	1.12	HE
2	Lack of seminars/ workshops	2.75	1.06	HE
3	Lack of good textbooks	2.58	1.20	HE
4	Distractions from the environment	3.00	.96	HE
5	Lack of qualified teachers	2.95	.75	HE
6	Problem of syllabus coverage	2.80	1.02	HE
7	Inadequate mathematical laboratories	2.75	1.06	HE
8	Lack of facilities	2.88	1.20	HE
9	Teachers' attitude to teaching	3.00	.96	HE
10	Not linking Mathematics with real life experience	2.92	0.77	HE
11	Reflecting Evaluation Process	2.55	1.12	HE
12	Misconceptions with Mathematics by students	3.02	1.10	HE
	Grand mean	**2.85**	**1.03**	

The results in table 2 showed that teachers to a high extent are of the opinion that these identified pedagogical issues influence their teaching of mathematics.

The means were all above the 2.50 bench mark, which indicates that all of them to high extent agreed that these pedagogical issues influence the teaching of mathematics.

Research Question 3

What are the Remedies to the Pedagogical Issues Identified?

Table 3: Remedies to the Pedagogical Issues Identified

S/N	ITEMS	MEAN	SD	DECISION
1	Engaging teachers on in- service training	3.40	.98	SA
2	Teachers should be engaged in seminars/ workshop	2.85	0.92	A

3	Encouraging teachers to use well structured text book	2.53	1.02	A
4	Reducing noise and other environmental issues while teaching	2.99	.80	A
5	Only qualified teachers should be allowed to teach mathematics in schools	3.56	.76	SA
6	Effective teaching should be made with less emphasis on the coverage	2.50	.80	A
7	Government should provide equipped laboratories in schools	2.70	1.03	A
8	Teaching facilities/materials should be made available both by the teachers and government	2.70	1.16	A
9	Teachers' teaching and listening style should improve	2.91	0.95	A
10	Mathematics teaching should always be linked real life situation	3.15	0.82	SA
11	Providing opportunities for mathematics learners to evaluate to evaluate and assess their own work	2.56	1.01	A
12	Mathematics teachers should explore effective ways of teaching mathematics to minimize/eradicate the conceptions learners have about mathematics	2.75	0.96	A
	Grand mean	**2.88**	**0.84**	

The means of all the items of table 3 were above the bench mark of 2.50 which indicates that the teachers agreed that when those remedies are put in place, it will help them teach mathematics without the pedagogical issues.

Discussion of Findings

The findings of this study indicates that, there are pedagogical issues which teachers identified that influence their teaching of mathematics. These pedagogical issues among others include teachers not having enough knowledge, lack of seminars / workshops, good text books, facilities and qualified teachers. Teachers' attitude to teaching, evaluation process and misconceptions with mathematics by the students are also inclusive. This study agrees with the work of Ginga et al (2019) who found out that, there are issues which hinder teachers from doing well in the classroom of which content, environmental and curriculum issues were all involved. . This study is also in tandem with the work of Zaid et al (2019) who identified the pedagogical issues as cankerworm in the teaching and learning of mathematics.

This study also found out that the pedagogical content knowledge (PCK) of the teacher is needed for the effective teaching of mathematics which is in tandem with the finding of Otun and Olaoye(2019).. When a teacher develops his PCK, such teachers' style of teaching, evaluation process and attitude to teaching will improve. In teaching of mathematics, he will emphasis more on the understanding of basic principles than on the mechanical teaching of mathematical computations. Students misconceptions of mathematics like mathematics is abstract, everyone cannot learn mathematics because it requires special ability and intelligence, getting the right answer in mathematics will be minimized/eradicated because of an effective pedagogy of mathematics.

This work also found out that most pedagogical issues are teacher based. This is in line with the findings of Ginga et al (2019) that found out that problem of poor performance in mathematics is teacher-based and curriculum based.

Conclusion

This paper concludes that there are pedagogical issues that hinder mathematics teachers from teaching properly. There are remedies that were equally suggested, which if taken care of will help teachers teach well. As mathematics has been identified as a very important subject, there is need to do everything humanly possible to promote its teaching.

Recommendations

The following recommendations were made based on the findings of this study,

1. There is the need for teachers' pedagogical content knowledge (PCK) to be improved so as to enable him to be effective in the teaching of mathematics

2. Those pedagogical issues that were identified should be taken care of by both the government and teachers.

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