EVALUATION OF THE IMPLEMENTATION OF MATHEMATICS CURRICULUM IN JUNIOR SECONDARY SCHOOLS IN ENUGU STATE

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Abstract
While the study evaluated the implementation of Mathematics curriculum in junior secondary schools in Enugu State, it used Stufflebeam's Context Input Process Product (CIPP) evaluation model. Six objectives and six research questions guided the study. The study adopted an evaluation survey design. The population of the study consisted of 30,154 students and 786 teachers. A sample of 400 students and 20 Mathematics teachers was randomly selected for the study. The instrument for data collection was validated by three experts. The instrument was Evaluation of the Implementation of Mathematics Curriculum in Junior Secondary Schools Questionnaire (EIMCJSSQ) and Mathematics Teachers Compliance Questionnaire (MTCQ). Cronbach Alpha Method was adopted to obtain the reliability coefficient of 0.81 for EIMCJSS and 0.75 for MTCQ. Data were analyzed using frequency counts, mean and standard deviation. Findings of the study revealed that the aims and objectives of mathematics curriculum were achieved to a high extent; the contents of mathematics curriculum have been covered very exhaustively by the teachers in junior secondary schools in Enugu State; teachers in Enugu State possess the required qualifications to teach Mathematics in junior secondary schools as stipulated in the curriculum. It is also found that the instructional materials/facilities necessary for teaching and learning mathematics were satisfactorily used; teachers sometimes complied with the use of appropriate teaching methods for teaching mathematics in junior secondary schools; teachers often used the various necessary evaluation techniques in the implementation of mathematics curriculum in junior secondary in Enugu. The study recommended that all stakeholders in the education sector should be actively involved in the junior secondary mathematics curriculum implementation because the promotion of mathematics education is the responsibility of all. Vice principals' academics and principals should ensure that mathematics teachers very often adopt the teaching methods specified in the mathematics curriculum. Seminars and workshops geared towards effective teaching and learning should be organized for mathematics teachers, so as to enhance teachers' use of appropriate teaching methods, and evaluation techniques to ensure maximum results.

Keywords: ***Evaluation, Implementation, Mathematics Curriculum,***

Introduction

Mathematics is the science that deals with the logic of shape, quantity and arrangement. It is all around us, in everything we do. It is regarded as the building block for everything in our daily lives, including mobile devices, architecture, money, art, engineering and every sport. Yadav (2017) defines Mathematics as the study of assumptions, its properties and applications. It is studied and applied in various fields of life world over, including Nigeria. Mathematics also finds application in the physical and natural sciences and by extension, relates more to the scientific and technological facets of man's world than to any other aspects. More so, it is mindfully applied in other school subjects in areas such as numbers and numeration, variation, graphs, fractions, logarithms and indices, algebraic process, solution of equation as well as in areas and volumes. It is also applied in areas that examine creation of innovations (Koichu, Aguilar & Misfeldt, 2021). The pivotal role Mathematics plays in other science subjects has made it a key instrument in proffering solutions to the problems arising in most branches of science and technology. It is as a result of this role that National policy on Education (FRN, 2013) in her National Policy on Education classified mathematics as a compulsory subject in both junior and senior secondary schools.

Mathematics is one of the subjects taught in Nigerian secondary schools. Mathematics has everything to do with human endeavors (Mala, 2023). United Nations Educational Scientific and Cultural Organization [UNESCO] (2012) averred that the effective teaching of mathematics across all educational levels sought to transcend basic numeracy, measurement and calculations to comprehension, discovering modeling and application in everyday lives of learners. Buttressing this point, Hudson, Henderson and Hudson (2014) asserted that the way Mathematics is taught in secondary schools determines the nature of the epistemic quality of the subject. Hudson (2013) also posited that high epistemic quality of Mathematics captures a teaching approach that presents Mathematics as a fallible, refutable and uncertain subject which promotes critical thinking, creative reasoning, the generation of multiple solutions and learning from trial and error thus evoking the idea of learner-centered approach. It is one of the core subjects in Nigerian secondary school curriculum and failure in it prevents a student from graduating to higher education

The word "Curriculum" began as a Latin word which means "a race" or the course of a race, coming from the verb "currere" meaning "to run/to proceed" (Curriculum, n.d).Going further, Ifeobu (2014) defined curriculum as a series of planned and unplanned learning activities to which a child is exposed in the course of their developments. Curriculum is therefore, the instructional document with which the school educates young people, a systematic and planned attempt that aims at effecting change in the behaviour of members of the society in which it situates. According to Shao-Wen (2012), there are varieties of definitions in relation to the term "curriculum." In relation to this work, curriculum can be seen as a mean of achieving specific educational goals and objectives. A curriculum in this sense can be regarded as a checklist of desired outcomes. Thus, Nigerian Educational Research and Development Council [NERDC] (2012) provides the curriculum for teaching Mathematics in junior secondary schools in Nigeria, which covers objectives, content, teaching-learning resources, teaching method, evaluation guide as well as the qualifications expected of Mathematics teachers. For instance, the teaching-learning resources expected to be used for teaching Mathematics in junior secondary schools as contained in the NERDC (2012) include: flash cards; newspaper; charts; counters such as match sticks, broom sticks, bottle tops; bank statement of account; thermometer; sum cards; Shapes of regular polygon: square, triangle, rectangle, parallelogram, trapezium, circle; Graph papers; Cubes; bricks; cuboids; ruler; tapes; empty cartoon; mathematics set; cardboard containing angles, pencil; Quadratic equation box; clinometers; Coins; Dice; Computer system; Thread or string; Table of values.

It is instructive to note that despite the pivotal role played by Mathematics as a secondary school subject, the attitude of students towards the subject as well as their performance in the subject have been everything but satisfactory. In support of the afore-mentioned assertion, Shehu (2020) observed that the high rate of failure in Mathematics, at both internal and external examination in Nigeria has remained a source of worry to educators, parents, students and government despite government's efforts towards finding a solution to the daunting challenge. The Junior School Certificate Examination (JSCE) results released by WAEC in 2020 revealed that 57.0% of the candidates that sat for the examination failed Mathematics (WAEC, 2020). A similar trend reared its ugly head in the most recently released JSCE results by West Africa Examination Council which declared that 42.7% of candidates emerged successful in Mathematics (WAEC, 2021). In Enugu State in particular, out of 17,875 students that sat for such examination in the same year 2021, only 16,506 scored a credit mark in Mathematics (National Bureau of Statistics, 2022). In the light of the afore-mentioned trend, there is need for evaluating the curriculum implementation process. Thus, Context, Input, Process and Product (CIPP) model was used in this study.

Context evaluation assesses needs, assets, and problems within a defined environment (Stufflebeam, 2007). It captures the definition of the environment in which the curriculum is implemented (a classroom or school) by the evaluator. Context evaluation provides information for the development of and evaluation of vision, value, goals and objectives. In this study, context evaluation covers the aims and objectives of Mathematics curriculum. More so, Stufflebeam stated that input evaluation assesses competing strategies and the work plans and budgets of the selected approach. Following this line of thought, Rathy (n.d) suggests that Input evaluation focuses on the intended means (procedural designs)

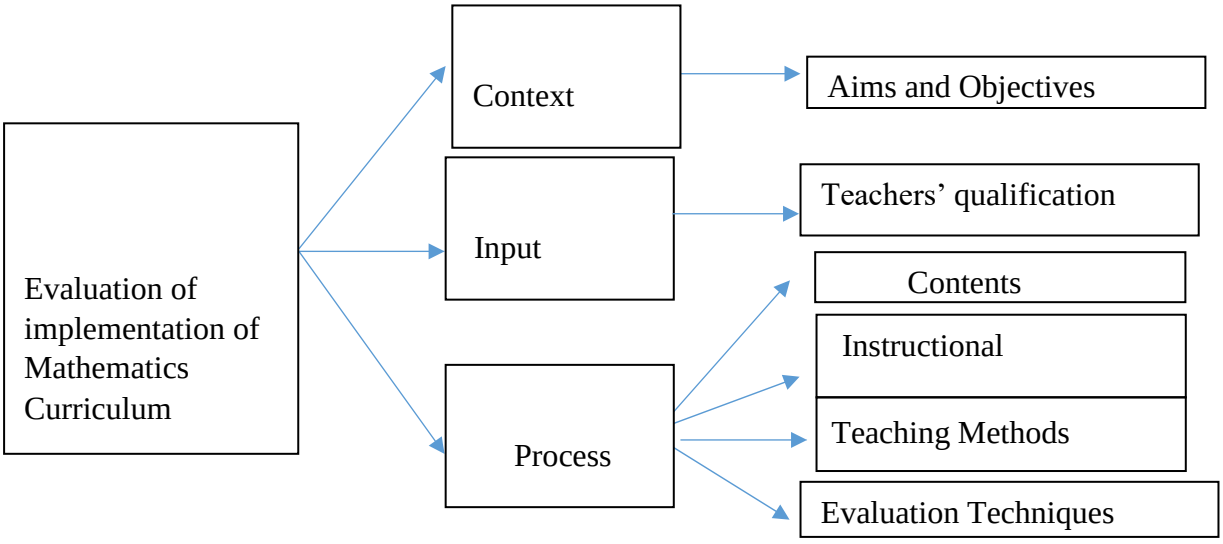
of executing the programme. Input evaluation in this study covers determining the qualifications of mathematics teachers who are implementing the curriculum.

Process evaluations monitor, document, and assess programme activities (Stufflebeam, 2007). Stufflebeam suggested that process evaluation could be used to determine programme's effectiveness. By implication, evaluators could investigate the mode of instruction used in teaching and learning. Here, teachers' effectiveness in teaching Mathematics could be of interest as well as students' participation as demanded in the curriculum. That is, process evaluation determines the rate at which teaching-learning processes, teaching methods, together with the co-curricular activities assure meeting up with the desired goals. In this study, the focus of process evaluation is on the teaching methods employed by teachers in teaching and learning of Mathematics in junior secondary schools, the contents of the mathematics taught to the students, the utilization of instructional facilities necessary for teaching mathematics, as well as the evaluation techniques employed by the teachers.

Product evaluation further referred to as effectiveness evaluation, documents and assesses the quality and significance of outcomes (Stufflebeamm, 2007). Stufflebeam suggested that evaluators could Interview key stakeholders, such as community leaders, beneficiaries, programme leaders and staff, and other interested parties, to determine their assessments of the programme's positive and negative outcomes.

The current study will, however focus on context, input as well as process. There is need to evaluate the implementation of mathematics curriculum for junior secondary schools using the afore-mentioned curriculum elements. This is with a view to finding out the extent to which the implementation of the curriculum is at the core of the trend of performance of junior secondary school students in Mathematics in Enugu State.

Figure 1: Schematic representation of the Concepts



The diagram above shows the elements of curriculum such as aims and objectives of mathematics curriculum, contents of mathematics curriculum, teachers' qualification, instructional materials/facilities, teaching methods, and evaluation techniques. The diagram shows that there are relationships existing among all these components of the curriculum.

The following research questions guided the study

1. To what extent are the aims and objectives of Mathematics curriculum being achieved in Enugu State junior secondary schools?
2. How well are the contents of mathematics being covered in Enugu State junior secondary schools?
3. How adequate are the qualifications possessed by teachers of Mathematics in Enugu state junior secondary schools?
4. What is teachers' level of compliance with appropriate teaching methods for Mathematics in Enugu State junior secondary school?
5. How adequate are teachers' use of instructional materials/facilities for teaching and learning of Mathematics in Enugu State junior secondary school?
6. How adequate are teachers' use of various evaluation techniques in the implementation of Mathematics curriculum in Enugu State junior secondary school?

Methods

This study employed survey research design. This design is considered appropriate for the present study because it dealt with the collection of data from mathematics teachers and their students for the implementation of mathematics curriculum. The population of this study comprises all the 786 Mathematics teachers and 30, 154 JSS students in the 292 public secondary schools in Enugu State, Nigeria. The instrument used for data collection in this study is questionnaire. The questionnaire was drafted in line with the National Curriculum for Secondary School Mathematics in NERDC (2012). The first questionnaire titled 'Mathematics Teachers Teaching Method Compliance' (MTTMC) has two parts. The first part sought information on 'Mathematics teachers' qualification'. It consists of 14 items in which teachers are expected to indicate their educational qualifications. The second part sought information on teachers' level of compliance with appropriate teaching methods for mathematics in junior secondary school and it has 14 items. It was constructed in a way that teachers would indicate the extent they use the required teaching methods: Very Often Used (VOU), Often Used (OU), Sometimes Used (SU) and Not Used (NU) respectively. The second questionnaire was titled 'Evaluation of the Implementation of Mathematics Curriculum in Junior Secondary School' (EIMCJSS). It was responded to by the students. It was divided into four clusters – One, two, three and four. Cluster one sought for information on achievement of the aims and objectives of mathematics curriculum in junior secondary school. It was constructed in such a manner that the respondents would respond using the four-point response options of Very High Extent (VHE), High Extent (HE), Low Extent (LE), Very Low Extent (VLE). It consists of 20 items. Cluster two sought information on teachers' use of instructional materials/facilities necessary for teaching and learning of mathematics in junior secondary schools. It was constructed in such a manner that the respondents would respond using the five-point response options of Very Satisfactory (VS), Satisfactory(S), Neutral (N), Dissatisfactory(D), Very Dissatisfactory(VD). It has 23 items. Cluster three sought information on teachers' use of evaluation techniques in the implementation of mathematics curriculum in junior secondary schools. It has 8 items. It was constructed in a way that the respondents will respond using a five-point rating scale of Always Used (AU), Often Used (OU), Sometimes Used (SU), Rarely Used (RU), and Never Used (NU). Cluster four sought information on mathematics teachers' coverage of Mathematics curriculum in junior secondary schools. It has 34 items. It was constructed in a way that the respondents would respond using a five-point rating scale of Very Well Covered (VWC), Well Covered (WC), Not Well Covered (NWC), Not Very Well Covered (NVWC), and Not Covered (NC).

Results

Research Question 1: To what extent have the aims and objectives of mathematics curriculum been achieved?

Table 1: Extent of Achievement of the Aims and Objectives of Mathematics Curriculum by Students (N = 400)

S/N	As a mathematics student,	Mean	SD	Decision
1.	I use mathematics to formulate and solve problems in daily life.	3.05	.93	HE
2.	Teaching and learning mathematics helped me to acquire some mathematical literacy	3.48	.97	HE
3.	I do measurement in mathematics.	3.15	1.01	HE
4	I apply some basic mathematical knowledge and skills in my daily activities	3.21	1.01	HE
5.	I have the ability to understand structures and patterns.	3.28	.95	HE
6.	I use mathematical language to communicate ideas	2.45	1.01	LE
7.	I now have the ability to use numbers for any mathematical operation.	3.36	.94	HE
8.	I use technology appropriately to learn and do mathematics	2.88	.99	HE
9.	I have obtained advantages due to my knowledge of mathematics	3.06	.88	HE
10.	I have a positive attitude towards mathematics.	3.08	.93	HE
11.	I have the capability of appreciating the cultural aspect of mathematics	2.81	1.04	HE
12.	I understand directed numbers and the real number system.	2.97	.96	HE
13.	I use algebraic symbols to describe relations among quantities.	3.09	.96	HE
14.	I understand equations, inequalities and formulas and functions.	2.94	.98	HE
15.	I understand measures for simple 2-D and 3-D figures.	2.45	.95	LE
16.	I understand the analytic approach to study geometric figures.	2.82	.87	HE
17.	I understand trigonometric ratios and functions.	3.00	.98	HE
18.	I understand statistical methods and statistical measures.	3.11	.97	HE
19.	I understand the simple ideas of probability and laws of probability.	3.15	.96	HE
20.	I learn mathematics independently and collaboratively for the whole life.	3.14	.93	HE
	Grand mean	2.98	0.96	HE

Note: Very High Extent (VHE) = 4, High Extent (HE) = 3, Low Extent (LE) =2, Very Low Extent (VLE) =1.

Findings from Table 1 reveal that the aims and objectives of mathematics curriculum are being achieved to a high extent on items 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 13. 14, 16, 17, 18, 19, and 20 with mean scores of 3.05, 3.48, 3.15, 3.21, 3.28, 3.36, 2.88, 3.55, 3.08, 2.81, 2.97, 3.09, 2.94, 2.82, 3.01, 3.11, 3.15, and 3.14 respectively. The findings revealed also that the aims and objectives of mathematics curriculum have also been achieved but to a low extent on items 6, and 15 with mean scores of 2.45, and 2.45 respectively. This shows that on the average, the respondents have achieved the aims and objectives of mathematics curriculum to high extent **(Mean = 2.98, SD = 0.**96**)**.

Research Question 2: How well are the contents of mathematics curriculum being covered by the teachers?

Table 2: Contents of Mathematics Curriculum covered by the Mathematics Teachers (N = 400)

S/N	The following topics have been covered by my mathematics teacher:	Mean	SD	Decision
1.	Number and numeration	4.47	95	WC
2.	Lowest Common Multiple (LCM)	4.21	1.13	WC
3.	Highest Common Factor (HCF)	4.52	.88	VWC
4	Counting in base 2	4.59	.80	VWC
5.	Conversion of base 10 numerals to binary numbers	4.50	.93	VWC
6.	Fractions	4.68	.74	VWC
7.	Rational and irrational numbers	4.59	.76	VWC
8.	Addition and subtraction of fraction	4.62	.79	VWC
9.	Multiplication and division of fraction	4.72	.65	VWC
10.	Estimation	4.58	.77	VWC
11.	Approximation	4.57	.84	VWC
12.	Addition and subtraction of numbers in base 2 numerals	4.49	.90	WC
13.	Transactions in homes and offices	4.35	1.01	WC
14.	Multiplication and division of directed numbers	4.41	.92	WC
15.	Multiplication of numbers in base 2 numerals	4.61	.79	VWC
16.	Use of symbols	4.54	.94	VWC
17.	Simplification of algebraic expressions	4.60	.87	VWC
18.	Simple equations	4.41	.96	WC
19.	Linear inequalities	4.45	.94	WC
20.	Graphs	4.53	.88	VWC

21.	Factorization	4.43	.93	WC
22.	Simple equations involving fractions	4.33	1.08	WC
23.	Simultaneous linear equations	4.32	1.06	WC
24.	Plane shapes	4.46	.92	WC
25.	Three-dimensional figures	4.41	.91	WC
26.	Similar shapes	4.63	.77	VWC
27.	Construction	4.58	.92	VWC
28.	Angles	4.58	.90	VWC
29.	Bearing	4.34	1.03	WC
30.	Trigonometry	4.41	.99	WC
31.	Area of plane shapes	4.47	.95	WC
32.	Probability	4.38	.98	WC
33.	Measures of central tendency	4.26	1.14	WC
34.	Need of statistics	4.25	1.12	WC
	Grand Mean	**4.47**	**0.92**	WC

Note: Very Well Covered (VWC) = 5, Well Covered (WC) = 4, Not Well Covered (NWC) = 3, Not Very Well Covered (NVWC) = 2, Not Covered (NC) = 1.

Findings from Table 2 reveal that the content of mathematics curriculum are being covered well on items 1, 2, 12, 13, 14, 18, 19, 21, 22, 23, 24, 25, 30, 31, 32, 33, and 34 with mean scores of 4.47, 4.21, 4.49, 4.35, 4.41, 4.41, 4.45, 4.43, 4.43, 4.32, 4.46, 4.41, 4.34, 4.41, 4.47, 4.38, 4.26 and 4.25 respectively. The findings revealed also that the content of mathematics curriculum are being covered very well on items 3, 4, 5, 6, 7, 8, 9, 10, 11, 15, 16, 17, 20, 26, 27, 28 and 29 with mean scores of 4.52, 4.59, 4.50, 4.68, 4.68, 4.59, 4.62, 4.72, 4.58, 4.57, 4.61, 4.54, 4.60, 4.53, 4.63 and 4.58 respectively. This shows that on the average, the contents of mathematics curriculum are being well covered by the respondents **(Mean = 4.47, SD = 0.**92**)**.

Research Question 3: What qualifications do teachers of mathematics in junior secondary schools possess?

Table 3: Qualifications Possessed by Mathematics Teachers in Junior Secondary Schools (N = 20)

S/N	Qualifications	Frequency	Percent
1	B.Sc. (Ed)Mathematics	3.16	40.0
2	B.Sc. (Ed) others	2.34	40.0
3	M.Ed. (others)	0.94	20.0
4	Others	0	0
	Total	**2.38**	100.0

Findings from Table 3 above reveal that 40% of the teachers that teach mathematics in junior secondary schools in Enugu possess B.Sc. Mathematics + PGDE as their highest academic qualification. This implies that those teachers studied Mathematics in their previous degree programmes and thereafter obtained Post Graduate Diploma in Education (PGDE). In the same vein, 40% of the teachers possess B.Ed. (Mathematic) as their highest academic qualification. 20% of the teachers possess M.Ed. in a different field of education other than Mathematics. However, all these teachers possess the required qualifications to teach Mathematics in junior secondary schools as stipulated in the curriculum. The findings from the table also reveal that none of the teachers teaching Mathematics in junior secondary school in Enugu possesses other qualifications as their highest academic qualification other than the educational qualification as required.

Research Question 4: To what extent do teachers use instructional materials/facilities necessary for teaching and learning of mathematics in junior secondary school?

Table 4: Extent Mathematics Teachers use Instructional Materials/Facilities for Teaching (N = 400)

S/N	The under-listed instructional materials/facilities are used by my teacher during mathematics lessons:	Mean	SD	Decision
1.	Computer system	3.22	1.62	N
2.	Flash cards	2.97	1.58	N
3.	Direct and indirect proportion chart	3.82	1.39	S

4	Thread and string	3.67	1.49	S
5.	Table rule	4.22	1.15	S
6.	Cylinder shaped objects	4.05	1.27	S
7.	Counters	3.86	1.34	S
8.	Sum cards	3.53	1.42	S
9.	Chart showing the multiplication of 2-digit binary numbers	3.77	1.37	S
10.	Chart showing the division of 2-digit binary numbers	3.71	1.37	S
11.	Quadratic equation box	3.74	1.37	S
12.	Ruler	4.41	1.02	S
13.	Table of values	4.08	1.25	S
14.	Pencil	4.19	1.19	S
15.	Flashcards of word problems	3.49	1.39	N
16.	Flashcards of simple equations showing problems	3.49	1.34	N
17.	Flashcards of simultaneous linear equations	3.72	1.32	S
18.	Similar shapes of triangle, rectangles, squares, cubes or cuboids	4.17	1.16	S
19.	Model of right-angled triangle	4.19	1.16	S
20.	Model of parallelogram or trapezium	3.88	1.28	S
21.	Model of circle and sectors	4.14	1.17	S
22.	Mathematical set	4.45	1.05	S
23.	Charts (Pie charts or barn charts)	4.19	1.25	S
	Grand Mean	3.87	1.32	S

Note: Very Satisfactory (VS) = 5, Satisfactory (S) = 4, Neutral (N) = 3, Dissatisfactory (D) = 2, Very Dissatisfactory (VD) = 1**.**

Table 4 results show that under the heading of instructional materials/facilities necessary for teaching and learning of mathematics in junior secondary schools, 19out of 23 instructional materials required were satisfactorily used for teaching and learning mathematics. The serial numbers of those satisfactorily used instructional materials are: 3, 4, 5, 6, 7, 8,9, 10,11, 12, 13, 14, 17, 18, 19, 20, 21, 22 and 23) with means: 3.82, 3.68, 4.22, 4.05, 3.86, 3.53, 3.77, 3.71, 3.74, 4.41, 4.08, 4.19, 3.72, 4.17, 4.19, 3.88, 4.1429, 4.45, and 4.19 respectively. The respondents were neutral about the use of the rest of the four instructional materials/facilities necessary for teaching and learning mathematics in junior secondary schools, with serial numbers: 1, 2, 15 and 16. The means of these four items are 3.22, 2.70, 3.49 and 3.49 respectively. From the above analysis in Table 4, it is clearly stated that not all instructional materials/facilities necessary for teaching and learning mathematics were satisfactorily used, because the respondents (students) were neutral (never sure) of their use in the first place. However, on the average, the instructional materials/facilities necessary for teaching and learning mathematics were accepted to be satisfactorily used **(Mean = 3.87, SD = 1.32)**.

Research Question 5: What are the teachers' levels of compliance with appropriate teaching methods for teaching mathematics in junior secondary schools?

Table 5: Teachers' Levels of Compliance with Appropriate Teaching Methods for Teaching Mathematics in Junior Secondary Schools (N = 20)

S/N	Teaching methods used by teachers during mathematics lessons:	Mean	SD	Decision
1.	Lecture method	1.00	.00	NU
2.	Project method	2.20	.41	SU
3.	Individualized method	2.50	.52	OU
4	Discussion method	2.40	.50	SU
5.	Concept mapping	1.80	.78	SU
6.	Guided discovery	2.40	.82	SU
7.	Analogy	2.80	.77	OU
8.	Role playing	2.60	1.23	OU
9.	Simulation and games	1.80	.78	SU
10.	Scaffolding	2.00	.00	SU
11.	Demonstration	3.80	.41	VOU
12.	Questioning	4.00	.00	VOU
13.	Summarizing/reviewing	3.00	1.12	OU
14.	Others/Illustration method	3.50	.53	VOU
	Grand Mean	2.21	0.63	SU

Note: Very Often Used (VOU) = 4, Often Used (OU) = 4, Sometimes Used (SU) =2, Never Used (NU) =1.

Table 5 shows result under the heading of teachers' levels of compliance with appropriate teaching methods for teaching mathematics in junior secondary schools. Out of 14 items (teaching methods), 1st to 13th item are the appropriate teaching methods for teaching mathematics in junior secondary schools as stated in the curriculum, while the 14th item is any arbitrary method adopted by teachers. Method 1, that is lecture method was never used (NU) for teaching and learning mathematics in junior secondary schools. This is indicated with the mean of 1.00. Methods 2, 4, 5, 6, and 9were sometimes used (SU), with the means of 2.20, 2.40, 1.80, 2.40, and 1.80 respectively. Method 3, 7, 8 and 13 were often used (OU), with the means of 2.50, 2.80, 2.60 and 3.00 respectively. Method 11, 12 and other arbitrary methods in item 14 were very often used (VOU), with means of 3.80, 4.00, and 3.50 respectively. From the above analysis in Table 5, it is clearly stated that teachers sometimes complied with the use of appropriate teaching methods for teaching mathematics in junior secondary schools **(Mean = 2.21, SD = 0.63)**.

Research Question 6: To what extent do teachers use various evaluation techniques in the implementation of mathematics curriculum in junior secondary school?

Table 6: Extent Teachers use Various Evaluation Techniques in the Implementation of Mathematics Curriculum in Junior Secondary School (N = 400)

S/N	My mathematics teacher:	Mean	SD	Decision
1.	Administers a test before starting each lesson	3.69	1.50	OU
2.	Administers a test at the end of each unit of a lesson	3.90	1.35	OU
3.	Administers a test in the course of an instruction	3.69	1.47	OU
4	Gives a take-home assignment at the end of each lesson	4.44	.98	OU
5.	Gives feedback on each test	4.39	1.14	OU
6.	Gives feedback on each take-home assignment	4.21	1.14	OU
7.	Does not give practical exams	2.64	1.53	SU
8.	Gives project on a weekly basis	3.78	1.39	OU
	Grand Mean	3.84	1.31	OU

Note: Always Used (AU) = 5, Often Used (VOU) = 4, Sometimes Used (SU) = 3, Rarely Used (RU) =2, Never Used (NU) =1.

Findings from Table 6 above revealed that most of the various evaluation techniques were often used in the implementation of mathematics curriculum in junior secondary school by the teachers on items 1, 2, 3, 4, 5, 6 and 8 with means of 3.69, 3.90, 3.69, 4.44, 4.39, 4.21 and 3.78 respectively. The findings also revealed that the evaluation technique in item 7 was sometimes used, with the mean of 3.69. On the average, mathematics teachers often used the various necessary evaluation techniques in the implementation of mathematics curriculum in junior secondary school in Enugu State **(Mean = 3.84, SD = 1.31)**.

Discussion

The findings in the above tables are discussed below:

Extent of Achievement of the Aims and Objectives of Mathematics Curriculum by Students

Findings from the first research question indicated that the aims and objectives of mathematics curriculum were achieved to a high extent by the respondents as well as the recipients. The two indices used in this measure are their understanding of some mathematical concepts and their ability to use mathematics in formulating and solving real life problems. The study revealed that junior secondary school students are proficient in using mathematics to solve mathematical problems such as structures and patterns, describing relations among quantities, measurements in mathematics, direct numbers and real number systems as well as exhibiting positive attitude towards mathematics.

Findings of this study collaborated with the findings of Zalmon, Ojimba, and Adauko (2020), who revealed that the extent of achieving the senior secondary education Mathematics curriculum objective is high with a unit increase in the context and process variables leading to a unit increase in the product variable while a unit increase in input variable leading to a unit decrease in the dependent variable.

Also, there was no significant joint contribution of the context, input, and process variables to the product variable in the implementation of the senior secondary education Mathematics curriculum. This shows that the junior secondary school students are achieving the mathematics education aims and objectives that have been designed for them in Enugu State. This was supported by the findings of Ifeobu (2014) who revealed that the aims, objectives and contents of biology curriculum for secondary schools were implemented to a moderate extent by biology teachers.

Contents of Mathematics Curriculum covered by the Mathematics Teachers

Findings from research question two (2) revealed that on the average, the contents of mathematics curriculum were well covered by the teachers. This implies that the mathematics teachers well covered topics like addition and subtraction of numbers in base 2 numerals, addition and subtraction of fractions and multiplication and division of fraction among others. This finding is in agreement with the findings of Zalmon et al. (2020) who showed that the contents of Mathematics curriculum were covered by the teachers in Obio/Akpor local government area of Rivers State. The result of the study is also in line with the findings of Ifeobu (2014) who indicated that the topical contents of the biology curriculum for senior secondary schools can achieve the objectives of the curriculum to a moderate extent if well covered as lack of effective coverage hampers teaching and learning. This is also in agreement with the findings of Fehintola (2017). Thus, the teachers covered the contents of mathematics curriculum well in Enugu State junior secondary schools. This might be as a result of their active involvement and participation in the teaching and learning of the above-mentioned contents in the mathematics curriculum.

Qualifications Possessed by Mathematics Teachers in Junior Secondary Schools

The findings from research question three (3) revealed that all the teachers in junior secondary schools in Enugu possess the required qualifications to teach mathematics in junior secondary schools. The findings further revealed that of the 20 Mathematics teachers, at least 40% of them possessed B.Sc. Mathematics + PGDE; another 40% possessed B.Ed. (Mathematic) as their highest academic qualification; 20% of them possessed M.Ed. in a different field of education other than Mathematics as their highest academic qualification; and none of them possessed other qualifications not required to teach Mathematics as their highest academic qualification.

This present finding has a link to the findings of Salami (2020) who revealed that there is a significant difference in the performance of students in Mathematics between those taught by B.Sc. holders and those taught by B.Ed. holders. Thus, there is a significant difference in performance of the students taught by professional and non-professional teachers in Mathematics. Those taught by B.Sc. holders tend to perform poorer. This is the result of improper placement of teachers. In this present findings, seeing that teachers in junior secondary school in Enugu possess the require qualifications, we may attribute the attainment of the curriculum objective (in table 0ne above) to this.

Extent Mathematics Teachers use Instructional Materials/Facilities for Teaching

The findings from research question four (4) revealed in this study that not all the instructional materials/facilities necessary for teaching and learning mathematics in junior secondary schools in Enugu were satisfactorily used. However, even though greater number of the respondents indicated that most of the instructional materials/facilities necessary for teaching and learning mathematics were satisfactorily used, the respondents never qualified the use of any of the instructional materials/facilities with the adjective “very”, which was the highest rating scale for the study. Being neutral about the use of certain necessary instructional materials/facilities (computer system, flash cards, flashcards of word problem, flashcard of simple equation showing fraction), the respondents indicated that they were never sure of the use of those materials, whether satisfactorily or dissatisfactory.

This finding is unlike the findings of Zalmon, et al. (2020), who revealed that the extent of utilizing effective instructional materials during the process of instruction in senior secondary Mathematics curriculum implementation by teachers was very low. This finding establishes that the use of

instructional materials/facilities for teaching and learning mathematics in junior secondary schools in Enugu State was satisfactory.

Teachers' Levels of Compliance with Appropriate Teaching Methods for Teaching Mathematics in Junior Secondary Schools

Findings from research question five (5) revealed that most of the teachers sometimes complied with the use of appropriate teaching methods for teaching mathematics in junior secondary schools. The evidence to this is that the teachers sometimes used methods like guided, discussion, Concept-mapping Method, project, scaffolding. Role playing Method, analogy and individualized were often used by the teachers. The findings also revealed that apart from demonstration and questioning methods, some teachers 'very often used' others methods not inspired in the curriculum for teaching mathematics in junior secondary schools. None usage of lecture method by the teachers could be as a result of its fashionable nature.

Compare to the finding of Ovute (2021) who found that secondary school teachers to a great extent use the required teaching methods in teaching social studies; the teachers sometimes do that while teaching mathematics in junior secondary schools in Enugu State.

Extent Teachers use Various Evaluation Techniques in the Implementation of Mathematics Curriculum in Junior Secondary School

Findings from research question six (6) indicated that various necessary evaluation techniques were often used in the implementation of mathematics curriculum in junior secondary school by the teachers. These evaluation techniques among others includes administering a test at the end of each unit of a lesson, allowing students to assess themselves by exchanging their test scripts with others for marking, and giving project on a weekly basis. However, teachers sometime give practical exams to the students. This could be due to the fact that practical evaluation technique is tedious, time consuming in implementation of the curriculum of teaching and learning. It is also very expensive.

Findings of this study collaborated with the findings of Zalmon, et al. (2020), who revealed that the extent of utilizing effective evaluation practices during the process of instruction in senior secondary Mathematics curriculum implementation is high. The result of the study differs from the work of Ifeobu (2014) which indicates that teachers use the recommended assessment techniques in assessing their students to a moderate extent.

Conclusion

The study evaluated the implementation of Mathematics curriculum in junior secondary schools in Enugu State and found that the aims and objectives of mathematics curriculum were being achieved to a high extent; that the contents of mathematics curriculum are being well covered by the teachers in junior secondary schools in Enugu State; teachers in Enugu State possess the required qualifications to teach Mathematics in junior secondary schools as stipulated in the curriculum. It is also found that the instructional materials/facilities necessary for teaching and learning mathematics were satisfactorily used; teachers sometimes complied with the use of appropriate teaching methods for teaching mathematics in junior secondary schools in Enugu; teachers often used the various necessary evaluation techniques in the implementation of mathematics curriculum in junior secondary schools in Enugu state.

Recommendation

In line with the findings of this study, the following recommendations are made:

1 All stakeholders in the education sector should be actively involved in the junior secondary mathematics curriculum implementation because the promotion of mathematics education is the responsibility of all.
2 School administrators and mathematics teachers should ensure effective utilization of all the available instructional resources and facilities in schools for effective curriculum implementation in Mathematics in junior secondary schools.
3 Vice principals academics and principals should ensure that mathematics teachers very often adopt the teaching methods as specified in the mathematics curriculum. To achieve this

purpose, seminars and workshops geared towards effective teaching and learning should be organized for mathematics teachers. These will help teachers on the use appropriate teaching methods, construction of test items, and evaluation techniques for a maximum result.

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