



**AN EVALUATION OF THE JUNIOR SECONDARY
SCHOOL MATHEMATICS CURRICULUM BY
MATHEMATICS TEACHERS IN EKITI STATE,
NIGERIA**

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Abstract

Evaluation determines the validity of the objectives and contents of a programme. Based on research findings, there have been no serious evaluation researches on secondary school Mathematics curricular. This research is centered on evaluating the Junior Secondary School Mathematics Curriculum (JSSMC) using the Stufflebeam Context, Input, Process and Product (CIPP) curriculum evaluation model. The study was a descriptive research which involved all the available 603 (289 males and 314 females) mathematics teachers selected from 150 proportionately and randomly selected Junior Secondary Schools in Ekiti State. An 11-item researcher-developed Mathematics Teachers' Curriculum Evaluation Questionnaire (MTCEQ) was used to gather data for the study. The MTCEQ was validated by two curriculum

experts; the test-retest method was used within an interval of three weeks and a reliability index of 0.78 was obtained using Pearson Product Moment Correlation statistic. Two research questions were generated and answered in the study. Data were analysed using frequency counts and simple percentages to answer the posed research questions. The findings indicated that the objectives of the JSSMC were considered adequate by the mathematics teachers while the contents of the curriculum were also considered suitable for the attainment of the specified objectives of the curriculum. Based on the findings of the study, it was concluded that the JSSMC was achieving its intended and underlying objectives and was therefore recommended that it should be retained.

Key words: *Curriculum; Evaluation; Mathematics Curriculum; Content; Teacher's gender.*

Introduction

The uniqueness of mathematics among other school subjects in the primary and secondary schools is vital, as any good student of mathematics easily copes with other school subjects. Mathematics as a school subject has been defined in many ways. According to Wikipedia (2014), mathematics is the study of quantity, structure, order, space and change. Okigbo and Osuafor (2008) defined mathematics as the pillar of science and technology whose functional role in the development of science and technology is multi-dimensional, such that all the areas of science, technology and business require its application. These definitions of mathematics indicated that without

mathematics, there is no science, without science there is no technology and without technology, there is no modern society (Salman & Ogunlade, 2011).

Mathematics is a culture which gives man the opportunity to know and access things and objects within his immediate and general environment. Thus, mathematics could be seen as a means for acquiring skills and habits for survival in the changing world (Amuche & Kukwi, 2013). The subject is therefore important for students at all the educational levels to develop the skills required to interpret and analyse information, simplify and solve problems, assess risks and make informed decisions and to apply such skills as artisans or in other trades to make a living (Abakpa & Agbo-Egwu, 2014).

On this note, the Nigerian Educational Research and Development Council (NERDC) developed an improved mathematics curriculum which is known as the Universal Basic Education (UBE) mathematics curriculum, launched by the former President Olusegun Obasanjo in the year 1999 in Nigeria. The review of the launched curriculum continued until 2007 when a new 9-year Basic Education Mathematics Curriculum (BEMC) was approved for implementation in September 2008 at the Junior Secondary Schools by the National Council on Education (NERDC, 2007). The curriculum was later reviewed by the NERDC in 2009 and resulted in the change of its name to Junior Secondary School Mathematics Curriculum (JSSMC), although the UBE system of education is still in operation (NERDC, 2009).

Researchers had however identified some hurdles towards the attainment of the effective implementation of the curriculum contents by teachers. For instance, Olorundare (2014) opined that curriculum implementation by teachers who are not familiar with the content as well as the source of the curriculum is one of the snags hindering the effective implementation of a curriculum. While Ebisine (2014) observed that, in Nigeria, curriculum implementation lacked periodic evaluation. According to the author, this aspect of curriculum development has not been properly or effectively addressed in Nigeria. This therefore makes it difficult to say whether the aims and objectives of the JSSMC are being achieved or not.

Evaluation is the process of assessing and judging a piece of work in an organisation or a service (Sarah, 2012). According to the author, the main purpose of evaluation is to help an organisation reflect on what it is trying to achieve, assess how far it is progressing and identify the required changes. Evaluation can provide empirical evidences that are used to take decision about required changes in a curriculum. In actual fact, evaluation has a significant role to play in any curriculum review/change.

Researchers had evaluated various school subjects' curricula in Nigeria. For instance, Awofala (2012) analysed the 9-year Basic Education Mathematics curriculum in Nigeria and submitted that the curriculum contents are evenly distributed and adequate. Akanbi (2010) carried out an evaluation of the Nigeria Certificate in Education (NCE) Physics curriculum by Lecturers and Students. The study's findings indicated that the objectives of the NCE Physics curriculum are adequate

for teacher training. In the same vein, Gotan (2005) evaluated the Christian Religious Knowledge (CRK) curriculum for Junior Secondary School (JSS) in Plateau State, Nigeria. The result showed that the content of the JSS CRK curriculum was quite adequate for achieving the objectives of the programme. Also, Badmus (1985) evaluated the then JSSMC and concluded that the objectives of teaching mathematics at the JSS level was adequate.

This research work is therefore focused on evaluating the JSSMC by mathematics teachers adopting the Stufflebeam context, input, process and product (CIPP) curriculum evaluation model by the researcher. The evaluation was limited to the context aspect, that is, the objectives and content of the curriculum.

Purpose of the study

The main purpose of the study was to determine mathematics teachers' evaluation of the context aspect of the JSSMC. Specifically, the study examined:

- i. the adequacy of the objectives of the JSSMC as assessed by mathematics teachers
- ii. the suitability of the content for the attainment of the specified objectives in the JSSMC as assessed by mathematics teachers

Research Questions

The following research questions were raised to guide the conduct of the study:

- i. What are the assessments of mathematics teachers on the adequacy of the objectives of the JSSMC?
- ii. What are the assessments of mathematics teachers on the suitability of the contents of the JSSMC for the attainment of the specified objectives?

Methodology

The study was descriptive research using the survey method. The population was all the mathematics teachers and students in JSS in Ekiti State while the target population was all the available mathematics teachers in the selected public and private secondary schools and all the students in the selected public JSS III in Ekiti State, Nigeria. Proportionate and random sampling techniques were used for selecting the sample for the study. Out of 1038 estimated mathematics teachers, six hundred and three (603) 289 male and 314 female were drawn from one hundred and fifty (150) public and private junior secondary schools. Proportionate sampling technique was used to select the number of schools to be used in each senatorial district while the random sampling technique was employed to select the participating schools. An 11-item researcher-developed Mathematics Teachers' Curriculum Evaluation Questionnaire (MTCEQ) was used to collect data for the study. The instrument (MTCEQ) was validated by curriculum experts in the Department of Science Education, University of Ilorin and one mathematics teacher in one of the selected secondary schools in Ekiti State, Nigeria. The test-retest method was used within an interval of three weeks and a reliability index of 0.78 was obtained.

Results

Based on the research questions raised, the results are as follows:

Research Question 1

What are the assessments of mathematics teachers on the adequacy of the objectives of the JSSMC?

Table 1: Analysis of mathematics teachers' assessment on the adequacy of the objectives of JSSMC (Context)

Sn	Items (objectives)	A		IN		Total	
		f	%	f	%	F	%
1	The objectives of the curriculum to make learners acquire Mathematical literacy necessary to function in an Information age	583	96.68	20	3.32	603	100
2	The objectives of the JSS mathematics curriculum to provide mathematical skills and concept necessary by the learners to thrive in the ever changing technological world	572	94.86	31	5.14	603	100
3	The objectives of the curriculum to develop the learner's essential elements of	567	94.03	36	5.97	603	100

	problem solving, communication, reasoning and connection within the study of mathematics						
4	The objectives of the curriculum to give the learners advantage to numerous career opportunities provided by mathematics	556	92.21	43	7.13	599	99.34
5	Flexibility of the curriculum to prepare students as job creators	407	67.50	180	29.8	587	97.35
					5		
6	The objectives of the curriculum to prepare learners for further studies in mathematics and other related fields of work.	561	93.03	42	6.97	603	100
TOTAL		3246	89.72	352	9.73	3598	99.45

Key: A= Adequate, IN= Inadequate, F= Frequency

Table 1 reveals that all the items of the questionnaire on the adequacy of the objectives are rated adequate by the mathematics teachers. The majority (89.72%) of the respondents assessed the objectives of the JSSMC as adequate while only 9.78% rated the objectives of the JSSMC as inadequate. This result therefore suggests that

them inadequate for the students/learners at this level. Based on the findings of this study, it could be concluded that the context aspect (that is the objectives of the JSSMC) of this curriculum is adequate.

Research Question 2

What are the assessments of mathematics teachers on the suitability of the contents of the JSSMC for the attainment of the specified objectives?

Table 2: *Mathematics teachers' assessment of the suitability of the JSSMC contents (Context) in Ekiti State*

Sn	(Content)	S		NS		Total	
		f	%	f	%	f	%
7	Sequential arrangement of the curriculum content for acquisition of meaningful and sound knowledge of concepts and principles	555	92.04	46	7.63	601	99.67
8	Appropriateness of the quantitative reasoning tasks stated in the curriculum for the attainment of the objectives	550	91.21	48	7.96	598	99.17
9	Suggested methodologies stated in the curriculum for the attainment of the	536	88.89	60	9.95	596	98.84

	objectives						
10	The content of the curriculum to prepare learners for further studies in mathematics and other related fields	556	92.21	45	7.46	601	99.67
11	The content of the curriculum to equip students sufficiently for challenges ahead	537	89.05	53	8.79	590	97.84
TOTAL		2734	90.68	252	8.36	2986	99.04

Key: S= Suitable, NS= Not suitable, F= Frequency

The analysis in Table 2 shows that 90.71% of the respondents were of the opinion that the contents of the JSSMC are suitable enough to attain the objectives specified in the curriculum as against the assessment by the remaining 8.46%. This implied that the content of the JSSMC (in terms of the Context aspect of the curriculum) is suitable for the level meant for as well as the attainment of the specified objectives meant to achieve.

Discussion

Based on the research questions posed, answered and interpreted, the analysis of result in Table 1 reveals that the objectives of JSSMC are adequate for the learners at the JSS level. The Table shows that 89.72% of the respondents upheld the view that the objectives of the curriculum were clearly stated and reflected the needs of

the learners for which it was designed. The result also showed that the objectives of the curriculum (that is the context aspect of the curriculum) were adequate enough to make learners acquire mathematics literacy necessary to function in an information age. The curriculum objectives reflected knowledge, skills, value and attitudes to make the students succeed in life and it provided the mathematical skills and concepts needed by the learners to thrive in the ever changing technological world. The curriculum was also capable of developing the learners in the areas of problem solving, communication, creativity, reasoning and connection within the study of mathematics. This could equally give the learners advantage to numerous career opportunities; prepare the students as job creators and also prepare them for further studies in mathematics and other related fields of work.

The findings therefore suggested that the mathematics teachers understood the objectives of the JSSMC as applicable to the learners. This result is in line with the research findings of Badmus (1985), who reported that the objectives of the JSSMC are adequate for the learners.

Table 2 revealed that the contents of the curriculum (also the context aspect of the curriculum) are well sequenced to make learners acquire sound knowledge of concepts and principles in mathematics. The quantitative reasoning tasks stated in the curriculum were appropriate, while the suggested methodologies specified in the curriculum were considered suitable. It was further indicated that the contents of the curriculum could

prepare students for further studies and as well equip them sufficiently for the challenges ahead.

This result indicated that the contents of the curriculum conformed to the stated objectives and it was suitable for the intended learners. One thing is for the contents to conform to the stated objectives; another thing is for the two to be suitable for the learners for which it was designed. The contents of the curriculum were up-to-date, relevant, balance and consistent with the learners' international norms and expectations of the larger society. The general assessment showed that 90.68% of the teachers held the view that the contents of the curriculum were relevant, adequate, suitable and valid. It could therefore be concluded that the contents were consistent with the objectives specified in the curriculum. This finding is in line with the view of Awofala (2012), who submitted that the contents of the BEMC are adequate and evenly distributed.

Conclusion

Based on the findings of this evaluation, it is concluded that:

The context aspect of this curriculum was adequate as examined by the mathematics teachers, who indicated in their assessments of the objectives that the objectives stated in the curriculum are adequate and flexible. In the area of the curriculum contents, the assessment by the teachers is that the curriculum contents were considered adequate, appropriate and suitable to cater for the academic competency of the learners as well as the needs

and aspirations of the society. The contents could be considered appropriate for students' needs and capabilities as students learn in different and individual ways. The contents of the JSSMC encourage the teacher to get acquainted with their students and it ensures direct teaching styles and classroom behaviour between them and their learners towards achieving the best learning outcomes for the learners.

Recommendations

Based on the findings of this study, it is recommended that:

1. Mathematics teachers should be actively involved at the planning stage of curriculum development, particularly in formulation of the curriculum objectives.
2. Regular workshops and seminars should be organised by the governments for mathematics teachers on methodologies suitable for a meaningful implementation of the curriculum contents.
3. Employers of mathematics teachers should provide opportunities for them to attend annual conferences organised by professional bodies, such as the Mathematical Association of Nigeria for update of knowledge in contents aspect of the curriculum.
4. Subject officers from the State Universal Education Board should embark on regular evaluation of the JSSMC in order to ensure that the right things are being done with regard to the

curriculum for better achievement in mathematics.

5. The context aspect of the JSSMC should be retained by the curriculum planners.

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