MATHEMATICS TEXTBOOK ANALYSIS: A STUDY ON RECOMMENDED MATHEMATICS TEXTBOOKS IN SCHOOL USE IN SOUTHWESTERN STATES OF NIGERIA

Dr. Afolabi Samson Sunday
School of Education, National Open University of Nigeria, Victoria Island, Lagos, Nigeria

Abstract

Textbook has been emphasized to be the most important tool in the teaching-learning process of Mathematics. It has been identified as one of the factors affecting students' learning outcomes. Few researches available on textbook rarely consider textbook analysis. Many of such have often reported paucity of research on textbooks and further research is thus recommended. This study is one of those on content analysis of Mathematics textbook. The study has provided empirical evidence on the relevance, suitability and adequacy of some recommended Mathematics textbooks in Southwestern Nigeria. Eleven features in the textbooks were analysed directly by the users (teachers). Mathematics teachers were purposively selected from two randomly selected public secondary schools in each of the senatorial districts of all the six states in southwestern geopolitical zone. The study comprised 117 Mathematics teachers as the total respondents from the 36 public secondary schools that were selected for the study. The comparison of the features was in line with the expectations of the Senior Secondary School National Mathematics Curriculum. The features were well provided for in the textbooks. The books were relevant, suitable and adequate in their provisions and capable of bringing forth desirable learning outcomes. The textbooks however, need further provision of Students' Workbook, Teachers' Guide, progressive hierarchy of tasks, multiple and attractive colours. The establishment of Textbook Standard Content Review Panel (TSCRP) was recommended to approve textbooks for school use after proper screening by this body. Years for reprint, re-editing were to be recommended by the committee or panel.

Keywords: Textbook analysis, Content evaluation, Mathematics textbook, SouthwesternNigeria, Textbook features, Relevant textbook, Suitable textbook, Adequate content

Introduction

Textbook as an instructional tool is unique among all other instructional media due to possession of certain characteristics. It is durable, permanent (not transient), portable and independent of electricity or electronic device when in use. It appears to be the oldest of instructional media. Due to its age-long existence and availability, it is common among teachers and learners more than any other medium. In his emphasis on textbook, Aggarwal (2001) alluded to the comment of UNESCO (1970) publication in *Preparing Textbook Manuscripts: A Guide for Authors in Developing Countries* by reporting that classroom teaching activities depend heavily on the textbook especially in the institutions where the teachers are not well qualified. On the same issue, he reported Altbach (1983) by saying that textbooks are central to schooling and has never been replaced in educational processes.

In spite of its usefulness to learning, Okwilagwe (1999) reported the general book availability (in a tangible form) at all levels of education to be on average of about 10%. This

refers to the ratio of books that are available to the users. This is an indication of low accessibility of textbooks to the users. There is no doubt that the paucity of books is negatively affecting the standard of education in Nigeria (Okwilagwe, 2001). Adesina (1990) in Okwilagwe (2001), described the characteristics of the book situation in Nigeria as an anomalous one.

On the aspect of concept presentation, Badru (2008) cited Fajemidagba (2000) by saying that the majority of available textbooks present Mathematics concepts, principles, theorems, proofs and models in a highly verbal and illogical manner without regard to the interface between the discipline of Mathematics and other subjects like Physics, Chemistry and Music. He also reported Kalejaiye (2005) on language of presentation that the results of most researchers showed that there are more English words to be learnt in Mathematics textbooks than in English textbooks. He noted that Mathematics terms, notations and symbols are also some new things to be learnt which are introduced in Mathematics textbooks.

Aggarwal (2001) suggested guidelines upon which the relevance and adequacy of textbook features could be evaluated. These are:

(1)Selection of content (2) Organization of content (3) Presentation of content
(4) Verbal communication (language) (5) Visual Communication (illustration).

To each of the items above, he identified some specific features, thus:

1. Selection of content: this consisted of eight parameters: (a) the content must be relevant (b) there must be adequate coverage of the content (g) there must be adequate content of each topic (d) there should be authentic content (e) there should be up-to-date content (f) there must be integrated content (g) there should be content linked with life.
2. Organisation of content. On this, he identified 3 parameters: (a) division into suitable unit, (b) division into suitable sections and (c) psychological approach to the content.
3. Presentation of content. (a) Attractive and appropriate title, (b) motivating presentation, (c) creative and interesting content.
4. Verbal communication (language). He pinpointed four parameters thus (a) appropriate vocabulary (b) short and simple sentences (c) correct spelling and (d) correct punctuation.
5. Visual illustration: Illustrations should be: (a) suitable for the mental level of students (b) easily portable and up to date (c) motivate learners (d) relevant and purposeful (e) accurate (f) simple and cheap and (g) large enough for sight.

Kochhar (1985) opined that in the selection or choice of a good textbook,

> *The textbook must be well-graded i.e. suitable for the capability of the children for which it is intended. The facts must be simple, clear and logically set out, fit into child-centred education. (p.101).*

For the general presentation format, he gave the following conditions; the textbook should be interesting, i.e. makes the learner interested in learning it, well written and beautifully compiled so that it might win and retain users' goodwill by virtue of more solid qualities. (2) It should be well-illustrated with attractive colour, inspiring drawings and photographs. It should be attractive, inviting, pleasant to look at and read, with well-chosen illustrations that are well connected and sequential. (3) The textbook should be up-to-date in content, frequently revised and reprinted when necessary. (4) The textbook must be complete with its table of contents, illustrations, charts or other references. And for higher classes' textbooks, he suggested inclusion of references at the end of each chapter for supplementary reading so as to inculcate in the learners the skill of comparison. It should also include the index. This is to give room for supplementary textbooks.

Several authors maintain that writing sustains the development of reasoning, communication and connections (Connolly and Vilardi, 1989; Countryman, 1981; Maimon, Nodine and O'Connor, 1983). Writing has also been found to be inherently related to the

development of metacognitive behaviours (Dominowsky, 1998; Kenyon, 1989; Pugalee, 1997; Tobias (1989) in Pugalee (2001)). However, not much research has been done on textual material as it affects learning outcomes in Mathematics. Hence, Pugalee (2001) reported "*Despite the seeming consensus of the important role of writing in learning, there is inadequate research on writing in Mathematics"*

Morgan (1998) also corroborated the fact by saying that "*although there have been considerable descriptions of the use of writing in Mathematics, there has been relatively little analysis of the texts themselves". (p.236).* Pugalee (2001) in his conclusion emphasized the need to address the paucity of research in this area. These reports are in the context of America and some other parts of the world. Johansson (2003) researched on textbook analysis on Mathematics education in Sweden also concluded that *'research on Mathematics textbook is still a rather unexplored field'* (p.1).

As a result of the importance of textbook to school teaching-learning process, the paucity of research on Mathematics textual materials and rare analysis of these textbooks themselves, this research work has considered the analysis of some common Mathematics textbooks in Nigerian secondary schools. The textual material factors such as statement of objectives, content of the subject matter, learners' activities, evaluation exercises, presentation, language, hierarchy of exercise, worked examples, solution and key to exercises, teachers' manual/guide, students workbook were assessed and analysed with respect to the availability, relevance, suitability and adequacy of these features in the textbooks based on the view of the users i.e. teachers.

Textbooks play an important role in Mathematics education because of their close relationship to classroom instruction (Johansson, 2003). Moreover, textbooks have a prominent position in curriculum reform and are considered the most important tool for the implementation of a new curriculum in many countries (Valverde, Bianchi, Wolfe, Schmidt and Houang, 2002). Internationally, it has been reported by research findings that there are limited studies on textbook especially along the line of textbook analysis (Morgan, 1998; Pugalee, 2001; Johannson, 2003).

Existing studies on Mathematics textbooks could be in three fold. These according to Johansson could be:

(1) The study of the structure and content of the textbook;

(2) Content analysis of the Mathematics textbooks;

(3) Studies on use of Mathematics textbook. This seems to be most common type of study available

1) The structure of most common Mathematics textbooks according to Johansson (2003) is 'exposition –examples – exercises' model (which this study called 3es), In the exposition part the author supports and clarifies concept formation by the student. It makes a sequential guide to discovery. This is followed by examples. Lastly, the exercises stage, these exercises are graded and they progress from the easier to the more difficult(Love and Pimm, 1996) just as the examples are in hierarchy of grades,. However, in an old study of German textbook, there was about twice as much text as task reported by Sträβer (1978).

In some other parts of the world like France, the organization and structure of Mathematics textbook is 'Activities-Cours-Exercise' model (ACE). The 'activities' is to introduce the notion to the students through small investigations. The 'Cours' describes what needs to be taught in words and in worked examples (Peppin and Haggarty, 2001).

Johansson (2003) commented on the unique, thorough and comprehensive review of relevant literature on Mathematics textbook made by Peppin and Haggarty (2001). They came out to say that existing studies on content and structure of textbooks could be divided into four main areas:

(i) The mathematical intentions of the textbooks – the Mathematics represented in textbooks, beliefs about the nature of the Mathematics in textbooks and presentation of mathematical knowledge;
(ii) The pedagogical intentions of the textbook –ways in which the learner is helped (or not) through the content, method and rhetorical voice of the text;
(iii) The sociological contexts of textbooks
(iv) The cultural traditions represented in textbooks. This present study concerns more on (i) and (ii).

2) Content analysis of Mathematics textbook

Three types of Mathematics textbook content analysis have been identified by Johansson (2003). Her own version which was different from already existing ones is the fourth. These are:

i) Distinguishing textbooks according to countries (such as the works of Peppin and Haggarty (2001), Valverde, Bianchi, Wolfe, Schmidt and Houang, (2002)). Third International Mathematics and Science Studies- TIMSS (1994/ 95)

ii) Restricted Areas of Mathematics concepts e.g. works of Harries and Sutherland (1999), Li (2000), Project 2061 (2000).

iii) How adherent the textbooks are towards the official goals and objectives of Mathematics education (e.g. works of Chandler and Brosnan (1995).

In their work, Chandler and Brosnan (1995) investigated the correspondence existing between the frequently used Mathematics textbooks series in sixteen school districts of Ohio with the *Ohio 9thProficiency Test.* They compared percentages of Mathematics textbook content with percentages of Mathematics content on the test. They found out that the content in the Mathematics textbook was disproportionate to the content of the proficiency test. They identified areas of concepts with disproportionate. Chandler Brosnan (1995) then recommended in line with National *Council of Teachers of Mathematics (NCTM) Standard* that: curriculum and assessment content should be aligned; the goals, objectives and instructional approaches should be aligned with the assessment task.

This study is in line with the work of Chandler and Brosnan (1995) in its focus in that it investigated how adherence the textbooks are towards official goals and objectives of the Senior Secondary School (SSS) Mathematics curriculum in terms of the availability, relevance, suitability and adequacy of certain characteristic features in the textbooks. Such features include objectives, contents, learners' activities, evaluation, language, presentation format etc. On the other hand, this study is also in line with Project 2061 (2000) and partly with Johansson (2003) in that these features for assessment were partly considered by these researchers too.

iv). Content analysis of a series of Mathematics textbook over a trend of time (e.g. Johansson, (2003). Based on three different curriculum reforms over 27 years (1969, 1980 and 1994) in Sweden, a series of Mathematics textbook was also reformed. She then compared how the curriculum reforms have caused variations in the series of the textbooks, by using ten characterizing features (ten blocks) among those already mentioned above. She found out that; the books progressively increased in pages and not much in variation in number of exercises and in word problems. The books were comparable and old ones could still be used.

3) Other areas of studies on Mathematics textbooks are on the area of use of Mathematics textbooks. These include the works of Röj-Lindberg (1999), Barr (1988), Fan and Zhu (2002), Freeman and Porter (1989) and Foxman (1999).

In the studies mentioned so far, the approach of the researchers were either that they personally evaluated the textbooks based on their set of existing standards e.g. Johansson (2003) or use expert analysts e.g. American Association of Advancement of Science (2002).

However, this study adopts different approach by making the Mathematics teachers who are the direct users to carry out the Mathematics textbook evaluation with respect to availability, relevance, suitability and adequacy of selected eleven features for desirable learning outcomes of the learners. Moreover, Johansson (2003) concluded by saying that '*generally speaking, which method to use for the analysis depends on the questions to be answered' (P.24).*

Project 2061(2000) was a team of expert Mathematics researchers, Mathematics teachers and Mathematics educators. They selected twelve middle grade Mathematics textbooks. They compared the contents of these books using six benchmarks (concepts). These benchmarks are: number concepts, number skills, geometry, skills, Algebra graph concepts, and Algebra equation concepts. Seven categories of instructional criteria upon which the books were analysed are: to what extent does the book identify a sense of purpose; building on students ideas about Mathematics; engaging students in Mathematics, developing Mathematics ideas, promoting student thinking about Mathematics, assessing student' progress in Mathematics, enhancing the Mathematics learning environment. Their research sought for the opinion of the analysts on many aspects such as the objectives, contents, evaluation, language, presentation, edition and manuals/guide, workbook etc, as pattern for book analysis. This research work also used similar and related features to analyse recommended Mathematics textbooks in our schools in terms of availability, relevance, suitability and adequacy of these features, since their presence or otherwise can affect learning outcomes.

The World Bank Study on Book Situation in Nigeria as reported by Okwilagwe (2001) said that the book availability ratio is far below expectation (about 10% nation-wide) while Adesina (1990) in Okwilagwe (2001) said that there is lack of relevance of the available ones even at high cost.

Adedayo (2000) selected two hundred senior secondary school students from twenty schools in Lagos state for her study on availability of basic teaching-learning materials in Mathematics. She reported the availability ratio of Mathematics textbooks to be 55%. She attributed the figure thus high as a result of book transfer. Uzoechi (2007) cited Obioma (2006) by saying that the existing textbooks are deficient for the new Science, Technology and Mathematics (STM) curriculum and that the existing STM textbooks will also be unable to meet the demand of the proposed restructuring at the post basic education level. He called for the review/assessment of the relevance and adequacy of the existing textbooks in compliance with the new curriculum specification of STM. He also called for the development of new textual materials for Science, Technology and Mathematics Education (STME).

The research report and recommendations of Pugalee (2001), Morgan (1998) from America and Johansson (2003) from Sweden corporately agreed that there has been very limited research on Mathematics textbook analysis internationally. They, with Li (2000) thus recommended the need for further research in this area.

Statement of the Problem

Mathematics and science textbooks used in schools in most part of the country have been criticized by stakeholders in education to be irrelevant. This is not because they have made analysis or criteria evaluation of these textbooks; it is rather because of the learning outcomes of the students at the end of the programme. Most statements of the critiques were not based on empirical evidence. Yet, most of the critiques have not been able to come up with a better option. Incidentally, it is not only textbook that determines learning outcomes. There is, therefore, a research need for the analysis of the appropriateness of recommended

(and used) Mathematics textbooks in schools in southwestern Nigeria so as to establish a basis for a true critique to enhance improvement.

The Study

The study made a survey of textbooks recommended and used in public schools of the sample under consideration. Three major textbooks found in the survey are *New General Mathematics (NGM) for West Africa; Mathematical Association of Nigeria (MAN) Mathematics; Science Teachers' Association of Nigeria (STAN) Mathematics* and very few otherswhich are perhaps numerically negligible. NGM is the most commonly used by many teachers and schools (Table 1). The number of items for availability, relevance, suitability and adequacy of each of the eleven features are summarized in table 2. The study considered the degree of availability, relevance, suitability and adequacy of certain features in the textbooks (Table 3). The standard for evaluation is in comparison with the expectations of the National Mathematics Curriculum, and also on the capability of the books to enhance desirable learning outcomes. The evaluation was based on the opinion of the Mathematics teachers who are direct users of the textbooks.

Table 1: Summary of Textbook Distribution in the Study

NGM	MAN	STAN	OTHERS
90	17	4	6
76.9%	14.5%	3.4%	5.2%

Table2: Summary of Number of Items Under Each Textbook Features

S/N	Textbook Features	Number of Items			
		Availability	**Relevance**	**Suitability**	**Adequacy**
1	Objectives	2	2	1	1
2	Content	3	3	4	8
3	Learners' Activities	4	4	3	3
4	Evaluation	1	2	3	4
5	Presentation Format	5	3	4	4
6	Language	3	2	2	2
7	Progressive hierarchy of tasks- examples & exercises	1	1	1	1
8	Worked Examples	1	1	1	1
9	Solutions/keys to Exercises	1	1	1	1
10	Teachers' Guide	1	1	1	1
11	Students' Workbook	1	1	1	1
	Total Number of Items	**23**	**21**	**22**	**27**

Population and sample

The study covered all the six states in the southwestern geo-political zone of Nigeria. Two schools were randomly selected from each of the three senatorial districts of each state. Teachers were purposively selected to be all Mathematics teachers who were teaching Senior Secondary School (SSS) level or who have taught these set of students at SSS level in time past with the same textbook series in the selected schools. Thus, excluding other Mathematics teachers who have not taught SSS with the series of the textbooks in their schools. A purposive selection is desirable (Clifford, 1997) for it has enabled the researcher to choose sample based on known characteristics. A total of 117 Mathematics teachers from the 36 schools formed the respondents. These were able to supply information on the textbooks because of their long years of experience in using the textbooks, as the study revealed that more than 80% of the teachers have been using the textbooks for more than 4years.

Instrumentation

The instrument *Recommended Mathematics Textbooks Rating Scale (REMTERS)* was used for data collection. REMTERS had 7 sections. Sections A, B and C were bio-data on Teachers, Textbooks and Schools respectively. Sections D, E, F and G in a tabular form solicited information on availability, relevance, suitability and adequacy respectively of 11 features selected for consideration in the textbooks. The same 11 features run through all sections D – G but with different number of items (table 2). Placement of items under any feature was based on how appropriate the items could measure the feature. However, each feature 7-11 stands alone as a single item as well as a single feature. Table 2 serves as the table of specification or blue-print.

The eleven textbook features were placed on a table with a dichotomous scale to measure availability. There were 23 items (responses) for availability of features scored as '0' and '1'.The sections on relevance, suitability and adequacy of textbook features had 21 items, 22 items and 27 items respectively (Table 2) and on a 3-point rating scale, rated as 0,1, and 2.

The instrument was validated and trial tested by using 11 Mathematics teachers from 4 senior secondary schools which were both private and public schools. These teachers and their schools were not included in the sample for the study. The instrument on availability had reliability index of 0.79 by using KR-20 formula because this section is on a 2-point scale while sections on relevance, suitability and adequacy had a reliability index of 0.76 using Cronbach alpha formula because each of them was on a 3-point scale.

Data Analysis

The data were analysed with descriptive statistics- mean and percentages. The items under each feature were scored accordingly. Thereafter, their corresponding percentages were also found. Then, the mean score for each feature was found. Variations (as seen in table 3) in the percentages between availability and 3 other measures existed because the highest mean rating for each feature under availability is 1 (scale rated as 1, 0) while the highest mean rating obtainable for each feature under relevance, suitability and adequacy is 2 (scale rated as 2, 1, 0). Thus, for a meaningful comparison and better interpretation, it was necessary to calculate the percentage of each mean (table 3). All the responses under each feature were scored and aggregated and then reported in a single value as the mean for that feature.

Findings: The summary of findings in the study is presented in table 3 below.

Table 3: Summary of Measures of Availability, Relevance, Suitability and Adequacy ofthe Textbook Features.

No	Textbook features	Availability		Relevance		Suitability		Adequacy	
		$\bar{x}$	(%)	$\bar{x}$	(%)	$\bar{x}$	(%)	$\bar{x}$	(%)
1.	Objectives	.88	(88.0)	1.46	(73.0)	1.53	(76.5)	1.35	(67.5)
2.	Content	.83	(83.0)	1.26	(63.0)	1.47	(73.5)	1.37	(68.5)
3.	Learners' Activities	.69	(69.0)	1.15	(57.4)	1.26	(63.0)	1.21	(60.5)
4.	Evaluation	.83	(83.0)	1.53	(76.5)	1.26	(63.0)	1.42	(71.0)
5.	Presentation Format	.68	(68.0)	1.18	(59.0)	1.28	(64.0)	1.19	(59.5)
6.	Language	.91	(91.0)	1.50	(75.0)	1.50	(75.0)	1.40	(70.0)
7.	Progressive hierarchy of of tasks-examples/exercises	.67	(67.0)	0.94	(47.0)	1.33	(66.5)	1.32	(66.0)
8.	Worked Examples	.90	(90.0)	1.41	(70.5)	1.43	(71.5)	1.33	(66.5)
9.	Solutions/keys to exercise	.81	(81.0)	1.38	(69.0)	1.39	(69.5)	1.31	(65.5)
10.	Teachers' Guide	.44	(44.0)	1.03	(51.5)	1.10	(55.0)	0.87	(43.5)
11.	Students' workbook	.31	(31.0)	0.77	(38.5)	0.85	(42.5)	0.74	(37.0)

$\bar{x}$ indicates the mean measure

Discussion

The textbook features are considered available if they are expressed in the textbook. Otherwise, they are not available. Relevance as a textbook feature refers to the degree of close correspondence to the expectations of the SSS Mathematics curriculum, and if it deals specifically with the requirements of the curriculum. If otherwise, it is not. Suitability as a textbook feature: the textbook is suitable if its features meet the standard of SSS curriculum, not above or below it. That is, if it is appropriate with the target audience, otherwise, it is not. Adequacy as a textbook feature refers to the extent of coverage in totally of all aspects enumerated by the SSS Mathematics curriculum and it also consists in the ability of the book to bring about a desirable learning outcome.

The statement of topical and sub topical objectives are made available (88%) in most of the textbooks. The objectives are relevant (73%) to the expectations of the curriculum, up to standard i.e. suitable (76.5%) and adequate as well (67.5%). It is an indication that making a fore statement of objectives is not a new or strange phenomenon to the authors and publishers of textbooks. Thus, they made adequate representation of these to the extent indicated.

The content of the textbooks includes prerequisite idea or prior knowledge needed before a task, answers to exercises and sequence of content. These were rated as available up to a point (83%). They are equally relevant to the national Mathematics curriculum. The content of students' workbooks measure 0.97 which is 48.5% on this scale. Another item of a low rate under the relevance of content is that of the teachers' guide (mean1.11 or 55%). All these items are under the relevance of the content. These brought the relevance of the content to a measure of 63%. The standard of the content, which is measured by its suitability, is 73.5%. This value was obtained by finding the average rating for all the 4 items (table 2) under suitability of content. The assessment of adequacy of the content includes relationship between worked examples and exercises, answers to exercises, coverage of final examination syllabus and that of senior secondary school Mathematics curriculum, arrangement of topics and sub-topics in appropriate hierarchy of knowledge. These 8 items altogether give a measure of 68.5% adequacy. This shows that the content coverage is fairly adequate.

Learners' activities: The availability of learners' activities, learner-centred activities and avenue created for students' learning activities in the course of the lesson (4 items altogether) have a measure of 69.0% availability for the books. The relevance of learners' activities provided by the textbook is mean=1.15 or 57.4%. There is an indication that the activities provided by the books bear low relevance with the expectation of curriculum of SSS Mathematics. The learners' activities also made adequate coverage (60.5%) of the curriculum and are capable of enhancing a desirable learning outcome.

The textbook made provision for evaluation with remediation and accurate answers to exercises. The evaluation exercises are relevant (76.5%), suitable (63.0%) and as well adequate (71.0%). The exercises are properly linked with the given examples. They bear a progressive hierarchy. Exercises provided for both weak (57.0%) and brilliant (59.5%) students are moderately suitable. The evaluation exercises provided are also adequate (71.0%). This is in terms of number, varieties, and coverage of SSCE, order and depth of knowledge.

The presentation format spells out the outlook of the book as to appeal to interest, emotion, attraction and positive feelings of the users. This is measured in terms of its colours, photographs, pictures, diagrams, format pattern/outlook, illustration in relation to local environment, font type and size, paper quality and its gender representation. The availability of this feature is 68.0%. Its relevance is 59.0%, suitability is 64.0% and its adequacy is 59.5%. These findings are contrary to the view of Fajemidagba (2000) in Badru (2008) who said that many contents of our Mathematics textbooks are presented in verbal and illogical

manner. These findings on presentation outlay are not too poor as to say that the books present concepts in highly verbal and illogical manner. However, there is much gap left to be improved upon. Moreover, no text can be perfect as to be termed ideal, except in a relative term. This depends on the parameter of assessment.

The aspects of simplicity of language of subject matter and language of instruction, correct punctuations and spellings which were assessed have availability of features to the tune of 91.0%. The relevance of the language is 75.0%, suitability is 75.0% while adequacy of familiarity and simplicity of the language is 70.0%. By and large, it could be said that the language use of the textbooks are appropriate.

Progressive hierarchy of tasks i.e. of examples and exercises has availability of 67.0%, relevance 47.0%, suitability 66.5% and adequacy 66.0%. It does appear that progressive hierarchy of task bears little relevance. This may likely be that the curriculum did not make provision for such hierarchy of relevance with which comparison could be made.

Worked examples were available (90.0%), relevant (70.5%), suitable (71.5%) and adequate (66.5%). Adequacy and relevance of suitable worked examples will reinforce understanding of the learners. All the textbooks have solutions and keys to exercises. These are relevant, suitable and adequate as well. This will serve as source of feedback for the learners to look back after making efforts to solve a problem. Most of the users could not get Teachers' Guide for their textbooks. The availability is 44.0%, relevance 51.5%, suitability is 55.0% and adequacy is 43.5%. Students' Workbook has availability of 31.0%, relevance 38.5%, suitability 42.5% while its adequacy is 39.0%. Both the Teachers' Guide and Students' Workbook are very low in availability. The students' workbook are not possessing relevant content as expected. Both are not adequate. The authors and publishers have not paid enough attention to these two parts of the textbooks.

The study revealed that the textbooks possess relevant features, suitable and adequate enough to yield a desirable learning outcome. It is also in accordance with the expectations of SSS Mathematics curriculum. Some aspects still to be looked into in the textbooks are content of Students' Workbook and learners' activities as well as Teachers' Guide.

It will not be an overemphasis to say that the best analyst is the users (teachers). With their qualifications, 72.6% possessed a minimum of first degree and 86.3% of the total sample specialized in mathematics. Also, 80% have been using the books for more than 4years. Comments of such reviewer could be counted reliable. They can competently make remarks on the hierarchy of exercises, make an inquiry as to which questions could be of appropriate standard or which ones have wrong keys/solutions and which one can be ambiguous or become knotty. It is in the process of working with the books among the students day-by-day that these can be discovered. Even though the questions and exercises may appear outwardly good it is in solving the questions that one gets the right judgment on the suitability of the questions in the textbooks. The works of other assessors/analysts may not reflect much on how valid the items and exercises are more than those of the teachers.

The claim on high degree of relevance, suitability and adequacy (appropriateness) of the textbooks by the teachers may not be acceptable in an absolute term. This is due to the following reasons; the textbook to a knowledgeable teacher, is a teaching guide whereas to the students, it is a learning guide. This implies that giving opportunity to the students to make an assessment might tend to reduce the level of the books' appropriateness. Also the exposure of teachers to other textbooks written in pattern to programmed instructions which is interactive in presentation, may make them reconsider a downward review of the appropriateness of their textbooks. In addition to this, one ought to know that the strength of the assessment depends on the strength of the curriculum which is the basis or yardstick of comparison. The series of the mathematics textbooks are many. Each series has contributed to the measure. If the modal textbook (*NGM,* table 1) is very appropriate, this may tend to

affect many other textbook series involved in the analysis. This may subdue the true picture of assessment of the textbooks, except if the analysis of each text series is separately reported.

Conclusion

The analysis of the textbooks was from the direct users who had full knowledge of the demand of the curriculum and that of the contents of the textbooks. It was most appropriate for these users to make the content analysis of the textbooks as a result of their experience. It was found (in a summary form for table 3) that the textbooks possessed the expected features (i.e. availability) to the tune of 74.2%. These features are also 62.9% relevant, 66.3% suitable and 64.4% adequate in conformity with the SSS National Mathematics Curriculum of Nigeria and in their ability to bring about a desirable learning outcome. Further investigations also showed that the textbook could not impact positively on the learners' attitude.

The Teachers' Guide, the Students' Workbook, Hierarchy of examples and exercises in the textbook reduced the appropriateness of the textbooks in that they are deficient in these areas.

The result of the analysis of the textbooks is at variance with the comments and opinions of some policy makers and scholars such as Badru (2008), Fajemidagba (2000) and Kalejaiye (2005) probably because their opinions were borne out of students' learning outcomes which have been continually poor. In such a case so many probable problems that may be responsible for poor performance are often cited. Not just because they have taken time to analyse the textbooks. Other factors which determine learning outcomes include student-variables, teacher-variables, environment-variables, the curriculum, the policies etc. Except each factor is partial out and thoroughly researched into (as in this study) one may not discover to which direction the causative factors are loaded.

The appropriateness of these books cannot be said to be in an absolute term, it is limited to users' (teachers) judgment. The efficacy of their assessment is also a function of their skill, exposure and other personal factors. If experts (non-users and students) are employed and various other ways could be used, provided that they come out with a similar result then one can claim absolute appropriateness of the textbooks.

Recommendations

The textbooks' authors and publishers should be trained to follow a given standard. The government should set up the standard and the pattern that every textbook authors and publishers should follow. The years of reprint and re-editing should be recommended if such books should continue to gain recommendation by the government.

Workbooks and teachers' guide should be written to accompany all recommended Mathematics textbook. The presentation format, font, colours and diagrams should be made attractive. More importantly, there is a need for further research on Mathematics textbook that can impact positively on students' attitude. There should be standard recommendation body to oversee matters. Mathematics textbook should have practical oriented tasks as much as possible. This could be written in interactive form to appeal to the emotion of the learners (affective learning). Practical activities should be suggested/recommended in the textbooks to enhance psychomotor learning. Other areas where practical and activities could be used, such as in 3-D objects and other areas should be recommended and not left to the discretion of the teachers.

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