Evaluation of Some Approved Basic Science and Technology Textbooks in Use in Junior Secondary Schools in Nigeria

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Abstract

This study was designed to evaluate the content adequacy and readability of approved basic science and technology textbooks in use in junior secondary schools in Nigeria. Eight research questions guided the study. The sample of the study consisted of six (6) approved basic science and technology textbooks, 30 Junior Secondary Schools randomly selected from the 6 geo-political zones of Nigeria, and 30 Basic science and technology teachers. Three (3) instruments were used for data collection: (1) Basic Science and Technology Textbooks Readability Test (BSTTRT) (II) 8-point evaluation model by Emerole (2008), an update of quantitative approach to the content evaluation of science textbooks (QACEST) by Nworgu (2001) (III) Teachers' Perception Rating Scale (TPRS). The 8-point model of QACEST was used to answer research questions 1,2,3,4,5 and 7, research question 6 was answered by using cloze model of readability measurement. The results of the findings showed that the some approved basic science and technology textbooks, have adequate contents, learning activities, illustrations, chapter summaries and study questions. The findings also indicated that the textbooks were culturally, ethnically and gender biased. Based on the findings, conclusions were drawn and was recommended that basic science and technology textbooks should be revised periodically to enrich the contents and readability of the textbooks and that a committee of specialists in science and technology should be appointed to selected and possibly approve textbooks for basic science and technology when the need arises, among others.

Introduction

Basic science and technology in education system in Nigeria, was as a result of the re-alignment and restructuring made in the curricula for primary science and junior secondary school integrated science. According to NERDC (2007), the overall objectives of the curriculum re-alignment and restructuring was to enable the learners to:

- Develop interest in science and technology
- Acquire basic knowledge and skills in science and technology
- Apply their scientific and technological knowledge and skills to meet societal needs
- Take advantage of the numerous career opportunities offered by science and technology
- Become prepared for further studies in science and technology.

To achieve these objectives, the use of adequate related textbooks becomes absolutely necessary. Science and technology textbooks are vital instructional material that enables a holistic presentation of science and technology contents to learners. Activities like, scientific enquire, identification of questions, planning, carrying out assignments and carrying out experiment are achieved by the use of science and technology textbooks. According to Baiyelo (2000), teachers and students depends so much on textbook as source of information to them.

Therefore, it became imperative to properly examine some of the textbooks approved for basic science and technology in Junior Secondary Schools in Nigeria so as to determine its' adequacies. This is because, there is every tendency that some of the approved basic science and technology textbooks in use in Junior Secondary Schools in Nigeria may lack the basic qualities of a good science and technology textbook.

Purpose of the Study

The purpose of the study was to evaluate approved Basic Science and Technology Textbooks in use in Junior Secondary Schools in Nigeria. Specifically, this study:

1. Determined how the contents of the basic science and technology textbooks in use in Junior Secondary Schools reflect the content specified in the curriculum for basic science and technology.
2. Determined the adequacy of the learning activities of each of the basic science and technology textbooks in use in Junior Secondary Schools.
3. Found out the appropriateness of each of the textbooks chapter summaries to the class level.
4. Determined the adequacy of the study questions in each of the textbooks.
5. Determined the illustration index of each of the basic science and technology textbooks.
6. Examined the readability levels of the textbooks for each of the classes.

7. Determined the under-represented population index.

8. Examined the teachers' perception of the basic science and technology textbooks as useful instructional aid to them.

Scope of the Study

The study was delimited to the evaluation of the approved Basic science and Technology textbooks currently in use in Junior Secondary Schools in Nigeria. The textbooks are:

- New Edition Junior Secondary Basic Science 1 by Ashiakpa Adaeze (Textbook A).
- New Edition Junior Secondary Basic Science 2 by Ashiakpa Adaeze (Textbook B).
- New Edition Junior Secondary Basic Science 3 by Ashiakpa Adaeze (Textbook C).
- NERDC Basic Technology for Junior Secondary School 1 by G.N. Nneji & Co (Textbook D)
- NERDC Basic Technology for Junior Secondary School 2 by G.N. Nneji & Co (Textbook E)
- NERDC Basic Technology for Junior Secondary School 3 by G.N. Nneji & Co (Textbook F)

Research Questions

The following research questions guided the study:

1. How do the contents of basic science and technology textbooks in use in Junior Secondary Schools reflect the contents specified in the core- curriculum?

2. How adequate are the learning activities of the basic science and technology textbooks in use in Junior Secondary Schools in Nigeria?

3. How appropriate are the chapter summaries of the basic science and technology textbooks in use in Junior Secondary Schools in Nigeria?

4. How adequate are the study questions of basic science and technology textbooks in use in Junior secondary schools in Nigeria.

5. What is the illustration index of basic science and technology textbooks in use in Junior Secondary Schools in Nigeria?

6. What is the readability index of basic science and technology textbooks in use in Junior Secondary Schools in Nigeria?

7. What is the under-representation population index of the basic science and technology textbooks in use in Junior Secondary Schools in Nigeria?

8. What is the teacher perception index of the basic science and technology textbooks in use in Junior Secondary Schools in Nigeria?

Research Design

Descriptive evaluation design was employed in this study. According to Ali (2006), evaluation design is the type of design that makes value judgement on programmes and projects based on certain pre-determined criteria. This design is useful because the study involved value judgment about basic science and technology textbooks in use in junior secondary schools in Nigeria.

Area of the Study

The study was carried out in Nigeria. Nigeria is located in western part of Africa. It has 36 states, including Federal Capital Territory (FCT) making it 37. The states are grouped under 6 geo-political zones. Specifically, the study covered all the 6 zones, namely; South East, South South, South West, North East, North West and North Central.

Population of the Study

The population of the study included all the approved basic science and technology textbooks in use in Junior Secondary Schools in Nieria, all the teachers for basic science and technology in Public Junior Secondary Schools and all the Junior Secondary Schools Students in Nigeria.

Sample and Sampling Techniques

Six (6) approved basic science and technology textbooks for junior secondary schools were simple randomly selected. 30 Junior secondary schools were randomly selected, 30 teachers for basic science and technology were drawn using a simple random sampling technique and all the students in the sampled schools were used.

Instrument for Data Collection

8-point quantitative evaluation model for science textbooks by Emerole (2008) was used for data collection. The model is an update of the 5-point quantitative approach for content evaluation of science textbooks (QACEST) developed by Nworgu (2001). It has following indices:

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* Topical Coverage Index (TCI)
* Learning Activity Index (LAI)
* Study Question Index (SQl)
* Illustration Index (ILl)
* Chapter Summary Index (CSI)
* Under-Representation Population Index (UPI)
* Readability and Comprehensibility Index (RCI)
* Teacher Perception Rating Index (TPI)

Topical Coverage Index (TCI): Provides an estimate of how far the content of the textbooks covers the prescribed syllabus.

Learning Activity Index (LAI): is an estimate of the degree of which the textbook provides activities that will ensure optimal participation of the learner.

Study Question Index (SQI): Estimates the extent to which the study question in textbooks challenges the learners meaningfully.

Illustration Index (ILI): Is an estimate of the extent to which illustration (diagrams, pictures, charts, tables graphs, equations etc.) contained in the book make for better and more meaningful understanding of the ideas being referred to in the textbook.

Chapter Summary Index (CSI): provides an estimate of the extent to which the chapter summaries promote a more permanent understanding of the content of the book.

Under-Represented Population Index (UPI): Estimate the extent to which the ideas, examples and illustrations that have gender or cultural/ethnic connotation. The textbooks are presented in a neutral or balanced form.

Readability and Comprehensibility Index (RCI):
Provides the quantitative estimate of readability and comprehensibility of a textbook.

Teacher perception Ration Index (TPI): Estimate the extent of teachers perceptions on how a text book provides instructional support to them.

Validation of the Instrument
The researcher adopted the 8-point quantitative approach for content evaluation of science textbooks, developed by Emerole (2008) an update of the 5-point quantitative approach for content evaluation of science textbooks (QACEST) developed by Nworgu (2001). The instrument does not need any other validation since the model is already a validated instrument.

Reliability of the Instrument
The 8-point model for content evaluation of science textbooks, as an update of 5-point (QACEST) model was assessed for reliability using Kendell's coefficient of concordance (W). This was necessary because basic science and technology teachers were used in the evaluation exercise. A reliability coefficient of 0.65, 0.69 and 0.90 were obtained for each of the textbooks using the rating of five teachers

Method of Data Collection
Data were collected using the 8-point quantitative approach for content evaluation of science textbooks, using basic science and technology textbooks. The basic science and technology teachers of junior secondary schools were trained on how to use the 8-point quantitative approach for the evaluation of basic science and technology textbooks to determine the indices of topical-coverage, learning-activities, study-questions, chapter-summaries, illustration index, under represented population index, readability and comprehensibility index and teacher's perception rating index.

Method of Data Analysis
The quantitative formulae of 8-point evaluation model were used to answer the research questions. A standard guideline for calculation and readability level by Harrison (1980) was used to determine students mean readability score in each of the textbooks. Teachers perception rating scale (TPRS), determined teacher perception on how a textbook provides instructional support to them.

Guidelines for Interpreting Close Test Scores by Harrison

Scores	Interpretation
60% and above	The students' understanding of the text is adequate and they can work on the book on their own.
40% to 59%	The students' understanding of the text is adequate enough for the book to be used with the teacher's assistance.
Below 40%	The students' understanding of the text is inadequate and the use of the book can lead to frustration.

Result of the Analysis
Research Question 1
How do the contents of basic science and technology textbooks in use in Junior secondary schools reflect the content specified in the core-curriculum? Based on the data collected, the topical coverage index (TCI) was analyzed. The scores of the six basic science and technology textbooks were calculated and presented in table 1.

$$\text{TCI} = \left(\frac{T_t}{Ts} + \frac{S_t}{S_s} \right) \tfrac{1}{2}$$

Where T_t = Number of topics covered by the textbook

T_s = Number of topics in the syllabus

S_t = Number of sub-topics sufficiently covered by the textbook.

S_s = Number of sub-topics in the syllabus.

Table 1: Indices of Topical Coverage (ITC)

S/N	TEXTBOOK	CLASS	T_t	T_s	S_t	S_s	Index
1.	A	JS 1	20	20	103	105	0.99
2	B	JS 2	25	26	98	101	0.97
3.	C	JS 3	24	22	101	111	1.00
4	D	JS 1	14	15	68	65	0.99
5	E	JS 2	12	14	74	66	0.99
6.	F	JS 3	21	30	94	100	0.82

Acceptance range = 0.75 to 1.00

The results presented in table 1 revealed that all the basic science and technology textbooks evaluated are within the acceptance range of topical coverage. This implies that they covered the content of the core-curriculum.

Research Question 2
How adequate are the learning activities of the basic science and technology textbooks in use in Junior secondary schools in Nigeria? The data collected on the learning activities from each of the six basic science and technology textbooks in use in Junior secondary schools in Nigeria were analyzed. Based on the results obtained, the learning activity index (LAI) was calculated and presented in Table 2.

$$\text{LAI} = \frac{(A - P)}{(A + P)}$$

Where, A = Number of sentences requiring the learner to perform some activities.

P = Number of sentences requiring the learner only to receive information with no other activity.

Table 2: Learning activity index

S/N	Textbook	CLASS	A	P	Index
1.	A	JS 1	194	35	0.69
2	B	JS 2	215	49	0.63
3.	C	JS 3	212	43	0.66
4	D	JS 1	137	26	0.68
5	E	JS 2	339	74	0.64
6.	F	JS 3	329	80	0.61

Acceptance range=0.50 to 1.00

The results presented in table 2 revealed the Learning Activity Indices (LAI) for the six basic science and technology textbooks evaluated. This implies that all the six basic science and technology textbooks contained leaning activities as specified in the core-curriculum.

Research Question 3

How appropriate are the chapter summaries of the basic science and technology textbooks in use in Junior secondary schools in Nigeria? The data collected on chapter summaries was used for the computation of chapter summary index (CSI). The results of the CSI for the six basic science and technology textbooks evaluated are presented in table 3.

$CSI = (J_s/J_c + N_s/N_c)/2$.

Where J_s=Number of statements in the summary which represent major points covered in the chapter.

J_c=Number of major points covered in the chapter.

N_s=Number of statements in the summary which represent   minor points covered in the chapter.

N_c=Number of minor points covered in the chapter.

Table 3: Chapter summaries Indices

S/N	TEXTBOOK	CLASS	J_s	J_c	N_s	N_c	Index
1.	A	JS 1	91	82	26	29	1.00
2	B	JS 2	115	107	36	40	0.99
3.	C	JS 3	113	108	34	41	0.94
4	D	JS 1	76	52	15	30	0.98
5	E	JS 2	69	47	22	57	0.93
6.	F	JS 3	118	84	24	42	0.99

Acceptance range = 0.60 to 1.00

The table 3 shows the results of the chapter summaries index (CSI) obtained from the data from the six basic science and technology textbooks in use in Junior Secondary Schools in Nigeria. The results revealed that all the six basic science and technology textbooks evaluated were within the acceptance range of chapter summary.

Research Question 4

How adequate are the study questions of the basic science and technology textbooks in use in Junior secondary schools in Nigeria? The data obtained was used for the computation of the Study-Questions Index (SQI). The computation of the SQI was based on the questions found in each of the six textbooks evaluated. The results are presented in table 4 below:

$$SQI = \frac{(T - R)}{(T + R)}$$

Where T = Number of questions that require students to engaged in real thinking

R = Number of questions that require student to merely recall knowledge.

Table 4: Study Question index (SQI)

S/N	Textbook	CLASS	T	R	Index
1.	A	JS 1	64	95	-0.19
2	B	JS 2	79	103	-0.13
3.	C	JS 3	74	99	-0.14
4	D	JS 1	64	54	0.08
5	E	JS 2	68	47	0.18
6.	F	JS 3	135	90	0.2

Acceptance range = -0.25 to +1.00

Table 4 shows the study questions index for the six basic science and technology textbooks (SQI) in use in Junior Secondary Schools in Nigeria. The results presented in table 4 reveals that all the six textbooks evaluated are within the acceptance range of study questions index. This implies that all the textbooks evaluated contained adequate study questions.

Research questions 5

What are the illustrations index of basic science and technology textbooks in use in Junior secondary schools in

Nigeria? The data obtained on illustrations found in each of the six basic science and technology textbooks evaluated were used for the computation of the illustrations index (ILI). The results are presented in table 5.

$$ILI = \frac{(L_a - L_b)}{(L_a + L_b)}$$

Where La = Number of illustrations requiring the learner to perform some activities.

Lb = Number of illustrations requiring the learner only to view.

Table 5: Illustration Index (ILI)

S/N	Textbook	CLASS	L_a	L_b	Index
1.	A	JS 1	19	49	-0.44
2	B	JS 2	25	67	-0.46
3.	C	JS 3	23	64	-0.47
4	D	JS 1	86	228	-0.45
5	E	JS 2	126	227	-0.29
6.	F	JS 3	146	279	-0.31

Acceptance range = -0.50 to 0.00

Table 5 above indicates the mean scores of the illustrations index (ILI) in each of the six basic science and technology textbooks evaluated. The results presented in table 5 reveals that the six textbooks evaluated are within the acceptance range of illustration index (ILI) of -0.50 to 0.00. This implies that all the textbooks evaluated contained illustrations.

Research Question 6

What is the readability index of the basic science and technology textbooks in use in Junior secondary schools in Nigeria? The data used in answering this research question were obtained from the "Close Test of Readability of Basic Science and Technology Textbooks" (CTRBSTT), the mean readability scores of the six basic science and technology Textbooks evaluation were computed and presented in the table 6.

Table 6: Readability Index

S/N	Textbook	CLASS	Mean Readability Score	Decision
1.	A	JS 1	65.1%	Very Readable
2	B	JS 2	67.1%	Very Readable
3.	C	JS 3	66.2%	Very Readable
4	D	JS 1	67.5%	Very Readable
5	E	JS 2	66.3%	Very Readable
6.	F	JS 3	68.2%	Very Readable

Acceptance range = 40% and above

Table 6 above shows the readability scores for all the six basic science and technology textbooks in use in Junior Secondary Schools in Nigeria. The results presented in Table 6 reveals that the readability scores of the evaluated textbooks are within the acceptance range of readability.

Research Question 7

What is the Under-Representation Population Index of the basic science and technology textbooks in use in junior secondary schools in Nigeria? The data obtained from the six basic science and technology textbooks evaluated were used to answer research question 7. The results of the data analysis are presented on table 7.

UPI = (G-B)/(G+B)

Where G = Number of illustrations, examples, gender and ethnic connoted statements that are neutral.

B = Number of illustrations, examples, gender, and ethnic connoted statements   that are biased.

Table 7: Under-Represented populations index (UPI)

S/N	Textbook	CLASS	G	B	Index	Decision
1.	A	JS 1	44	9	0.66	Accepted
2	B	JS 2	69	17	0.60	Accepted
3.	C	JS 3	67	14	0.65	Accepted
4	D	JS 1	272	45	0.72	Accepted
5	E	JS 2	319	35	0.80	Accepted
6.	F	JS 3	294	161	0.29	Accepted

Acceptance range = -1.00 to +1.00

Table 7 shows the under-represented population index for each of the basic science and technology textbooks evaluated. The results presented in table 7 reveals that all the basic science and technology textbooks evaluated are within the acceptance range of under-represented populations index (UPI) of -1.00 to +1.00.

Research Question 8

What is the teacher perception index of the basic science and technology textbooks in use in junior secondary

schools in Nigeria? The data used in answering this research question 8 were obtained from teachers' perception rating scale (TPRS), an instrument development by Emereole and Rammiki (2004) and adopted for the study. The results obtained are presented on table 8.

Table 8: Mean rating of Teachers perception index of the basic science and technology textbooks.

	A	B	C	D	E	F
S/N	JS1	JS 2	JS 3	JS 1	JS 2	JS 3
1	3.09	3.07	3.18	3.68	4.01	4.03
2	3.06	3.09	3.00	3.09	3.51	3.53
3	3.07	3.01	3.09	3.07	2.69	3.70
4	2.39	2.39	2.39	2.38	2.61	2.66
5	3.61	3.73	3.63	3.55	3.69	3.67
6	3.29	3.40	3.39	3.37	3.76	3.79
7	3.33	3.57	3.37	3.43	3.48	3.67
8	3.59	3.20	3.66	3.77	3.32	3.50
9	2.78	2.87	2.79	2.71	2.90	3.87
10	3.47	3.23	3.47	3.30	3.00	3.43
11	2.10	2.33	2.40	2.89	2.99	2.98
12	3.26	3.67	3.37	3.33	3.41	3.46
13	3.79	3.93	3.86	3.66	3.60	3.97
14	2.75	2.80	2.84	4.11	4.01	4.20
15	3.10	3.20	3.37	3.28	3.44	3.49
16	2.69	2.43	2.79	2.69	2.68	2.77
17	3.37	3.97	3.57	3.36	3.67	3.97
18	1.66	1.47	1.57	1.63	1.73	1.83
19	3.51	3.83	3.52	3.52	3.58	3.57
20	3.70	3.81	3.89	3.79	3.81	3.89
	3.08	3.15	3.16	3.23	3.29	3.50

Acceptance range = 3.00 to 5.00

The major findings of the study based on the eight research question that guided the study are:
1. Correspondence of the content of the basic science and technology textbooks evaluated with the specification of the core-curriculum.
2. Adequacy of the learning activities of the basic science and technology textbooks in use in Junior Secondary Schools in Nigeria.
3. Appropriateness of the chapter summaries of the basic science and technology textbooks in use in Junior secondary schools in Nigeria.
4. Adequacy of the study questions in the basic science and technology textbooks in use in Junior secondary schools in Nigeria.
5. Appropriateness of the illustration in the basic science and technology textbooks in use in junior secondary schools in Nigeria.
6. Readability of the basic science and technology Textbooks in use in Junior Secondary School in Nigeria
7. The under-represented population index in the six basic science and technology textbooks evaluated.
8. The teachers' perception of the basic science and technology textbooks in use in junior secondary schools in Nigeria.

Correspondence of the content of the basic science and technology textbook evaluated with the specification of the core-curriculum.
The result obtained indicate that the topical coverage index (TCI) or index of topical coverage for the six basic science and technology textbooks were as follows, 0.99, 0.97, 1.00, 0.99, 0.99 and 0.82 for textbooks A, B, C, D, E and F respectively. The index of the topical coverage of the six basic science and technology textbooks are high, it could be that the authors consulted the core-curriculum before writing the textbooks. The results of the finding are not in conformity with some earlier studies. The result of the findings in this study agreed with the work of Emereole and Rammiki (2008), who evaluated the content of all the physics textbooks used in Botswana secondary schools and reported that the index of topical coverage (ITC) were high.

The results of this study indicate that the contents of the six basic science and technology textbooks evaluated and which are in use in junior secondary schools in Nigeria correspond with the specification of the core-curriculum.

The Adequate of the learning activities of the basic science and technology textbooks in use in junior secondary schools in Nigeria

The results obtained showed that the mean score for each of the six textbooks were as follows: 0.69, 0.63, 0.66, 0.68, 0.64 and 0.61 for textbooks A, B, C, D, E and F respectively. The result indicates that the learning activities indices in these six basic science and technology textbooks are adequate. This result of the finding agreed with the study carried out by Omiko (2011), his study revealed that the learning activities in the chemistry textbooks evaluated in Ebonyi state of Nigeria were adequate.

Appropriateness of the Chapter Summaries of the basic science and technology textbooks in use in Junior Secondary Schools in Nigeria.

The results of data analysis obtained for the study indicate that all the basic science and technology textbooks evaluated had chapter summaries, which is as follows: 1.00, 0.99, 0.94, 0.98, 0.93 and 0.99 for textbooks A, B, C, D, E and F respectively. This shows that all the textbook evaluated have chapter summaries with high indices.
The finding of the study agreed with the study of Omiko (2011), who evaluated the content and readability of some recommended chemistry textbooks in Ebonyi state secondary schools. The study reported that the chemistry textbooks cover the syllabus appropriately and also contain adequate chapter summaries.

Adequacy of the Study Questions in the six basic science and technology Textbooks in use in Junior Secondary Schools in Nigeria.

The data collected and the results obtained showed that the six approved basic science and technology textbooks in use in junior secondary schools in Nigeria had the following mean scores: -0.19, -0.13, -0.14, 0.08, 0.18 and 0.2 for textbooks A, B, C, D, E and F respectively. These results indicate that all the textbooks used in this study contained study questions. This is in line with Baiyelo (2000), who evaluated the content and readability of some selected physics textbooks.

Appropriateness of the Illustrations Index in the six basic science and technology Textbooks Evaluated.

From the data collected on illustration index in each of the six basic science and technology textbooks, it was found that the textbooks had the following mean scores. -0.44, -0.46, -0.47, -0.45, -0.29 and -0.31 for textbooks A, B, C, D, E and F respectively.

The results showed that the illustration index in all the six basic science and technology textbooks is low. The results of the findings agree with Umoke and Nwafor (2015) who evaluated the content and readability of some approved computer studies textbooks in use in Junior Secondary Schools in Ebonyi State of Nigeria. He reported that the computer studies textbooks have low illustrations index and that the illustrations in the textbooks are not adequate. He recommended the revision of these textbooks to include illustrations.

Readability of the basic science and technology Textbooks in use in Junior Secondary School in Nigeria.

The data collected and the results obtained on readability showed that the six basic science and technology textbooks evaluated had the following mean readability scores: 65.1%, 67.1%, 66.2%, 67.5%, 66.3% and 68.2% for textbooks A, B, C, D, E and F respectively.

The result indicate that all the six basic science and technology textbooks evaluated are readable, the findings are in agreement with Umoke and Nwafor (2015) whose work showed that all the computer studies textbooks he evaluated are readable.

The Under-represented Population Index (UPI) in the six basic science and technology textbooks evaluated

The result of findings showed that the mean scores of all the textbooks evaluated were as follows: 0.66, 0.60, 0.65, 0.72, 0.80 and 0.29 for textbooks A, B, C, D, E and F respectively.
This indicates that the six basic science and technology textbooks are culturally, ethnically and gender biased. They contain some terms and illustrations that are not acceptable to both males and females. These terms and illustrations may discourage the genders that are not favoured and this may make them become disadvantaged in the subject.

The Teachers' Perception of the six basic science and technology Textbooks in use in Junior Secondary Schools in Nigeria

The summary of the results was presented on table 8; it revealed the mean rating scores of all the six basic science and technology textbooks are within the acceptance range of 3.00 to 5.00. The questionnaire items which the teachers rated were drawn from the core-curriculum of basic science and technology. It covered the following areas:
1. **Content coverage:** The textbook coverage of topics and sub-topics specified in the syllabus

2. **Presentation of content:** How the content is presented to direct learners' attentions to the main ideas.
3. **Illustrations:** The alternative ways of presenting or explaining information as in diagrams, graphs, pictures, tables, charts etc. to reach learners of different abilities.
4. **Problems solving activities:** Analyzing and manipulating data, drawing conclusions and making predictions.
5. **Experimental and investigative activity:** Doing scientific experiments and planning investigations in order to develop the skills.
6. **Study questions:** Questions and exercises at the end of chapters or sub-topics meant to promote development of thinking skills and problem solving strategies.
7. **Worked examples:** Questions and their solutions in the textbooks to demonstrate problems-solving and applications of knowledge.
8. **Readability:** The ease with which learners can read and understand the textbook.

The teachers' perception of the six basic science and technology textbooks as their instructional aid was presented on table 8 the mean rating scores for the six textbooks were as follows: 3.08, 3.15, 3.16, 3.23, 3.29 and 3.50 for textbooks A, B, C, D, E and F respectively. Since these results were above 3.00, it implies that the teachers agreed that these textbooks provide instructional support to them.

Conclusions

Based on the results of the findings of the study, the following conclusions were drawn:
1. The contents of all the basic science and technology textbooks evaluated appropriately reflected the contents specified in the core-curriculum.
2. All the six basic science and technology textbooks in use in Junior Secondary Schools in Nigeria contain learning activities.
3. All the six basic science and technology textbooks in use in Junior Secondary Schools in Nigeria contain chapter summaries. The researchers concluded that the chapter summaries of the basic science and technology textbooks in use in Junior Secondary Schools in Nigeria were appropriate.
4. All the basic science and technology textbooks in use in Junior Secondary Schools in Nigeria contain study questions.
5. The six basic science and technology textbooks have low illustration index.
6. Based on the Harrison's (1980) interpretation of cloze readability of textbooks, it was found that all the six basic science and technology textbooks in use in Junior Secondary Schools in Nigeria are readable.
7. The six basic science and technology textbooks have high under-represented population index. The researchers concluded that these textbooks were culturally, socially, ethnically and gender biased.
8. The teachers' perception of the basic science and technology textbooks in use in Junior Secondary Schools in Nigeria was adequate. This was reflected on the mean scores of all the basic science and technology textbooks evaluated. Based on this the researchers concluded that the teachers affirmed that the textbooks are useful to them in their instructional delivery.

Recommendations

Based on the findings and conclusions of this study, the researchers made the following recommendations:
1. Scientific knowledge and discoveries are increasing everyday, it is necessary that all the basic science and technology textbooks in use in junior secondary schools in Nigeria should be revised periodically. This would help to enrich the content and readability of the textbooks. Those basic science and technology textbooks whose readability and contents are high should be recommended for the Junior Secondary Schools.
2. A committee of specialists/experts should be appointed, to select and recommend basic science and technology textbooks. Such specialists/experts should include: education specialists, basic science teachers, basic technology teachers, curriculum planners, basic science and technology textbook authors, expert representative from both State Universal Basic Education Board and Science Teachers Association of Nigeria (STAN). The selection and recommendation of any basic science and technology textbook should be based on acceptable yardstick (standard) prescribed by the expert.
3. Students and teachers are advised to use many of the approved basic science and technology textbooks in both their studies and lessons. The students should consult the core-curriculum before deciding on the basic science and technology textbook to use. Those basic science and technology textbooks that are readable and has high content validity should be selected.
4. Basic science and technology textbook authors and publishers should consult core-curriculum when writing and publishing their books. This will help them to choose topics, performance objectives, contents and learning activities from the specified core-curriculum. This would help the authors to achieve high topical coverage, learning activities, study questions and chapter summaries indices.
5. Science and technology professionals and Educational bodies, Government, donor agencies, private school

proprietors should help to organize conferences, seminar and workshops for basic science and technology teachers on the recent scientific inventions and the best way of facilitating the knowledge into the students.

6. Federal Ministries of Education should organize workshops and conferences for the textbook authors and publishers on how to organize and use the core-curriculum in writing high quality textbooks.

7. One textbook should not be recommended. It is always better to use more than one textbook in any particular subject. A particular deficiency in one textbook may be covered or treated better by others.

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