

Evaluation of Content and Chapter Summaries of Approved Basic Science Textbooks in Ebonyi State Junior Secondary Schools in Nigeria

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Abstract

This study evaluated the topical coverage and chapter summaries of 12 (twelve) approved basic science textbooks in Ebonyi State junior secondary schools. The study was carried out in Ebonyi State of Nigeria. Two research questions and one hypothesis guided the study. Evaluation research design was adopted. One instrument was used, A 5-point quantitative approach for content evaluation of science textbooks (QACEST). QACEST formula was used to answer research questions while the null hypothesis was tested using chi-square test of goodness of fit. The result revealed among others; STAN basic science project, spectrum basic science, basic science for upper basic all had adequate topical coverage while basic science for Nigerian junior secondary school had topical coverage inadequate. The study also identified that chapter summaries of 9 basic science textbooks out of twelve (12) basic science textbooks evaluated are inadequate. The remaining four (4) basic science textbooks do not have chapter summaries at all. Based on the findings, the study recommended that all basic science textbooks use for teaching students need to be periodically revised with the view to make them to have acceptable content validity and enrich them in terms of content and chapter summary. That authors and publishers of any basic science textbooks should consult basic science core-curriculum in order to draw topics, objectives, contents and activities from the core-curriculum.

Keywords: Basic Science, Topical Coverage, Chapter Summary, Evaluation Research, QACEST

1. Introduction

Concepts in science do change from time to time rendering an older edition of a book obsolete. Therefore science textbooks especially basic sciences have to be continuously evaluated in order to examine the appropriateness and update of the contents of the texts in use so as to give the right type of education as well as meeting up with the dynamic changes in the field of science and technology.

For any programme or curriculum to be effective, it should be thoroughly evaluated in order to assess, measure the overall success and identify areas of weakness and make recommendation for change where possible and necessary. The importance of textbook evaluation cannot be overemphasized especially in the areas of content and chapter summary. Textbooks especially science ones and specifically basic science texts not only govern what is to be taught, but also provide a procedure for teaching the topic. Many of the curriculums in today's schools are to be found in the text books. Therefore, no meaningful teaching and learning can be easily achieved in the absence of a good textbook. According to Ali (1998), a good science teaching materials include a review of the main theme of the completed chapter. The review is usually in the form of a summary of the main points of a particular chapter and may include chapter review or summary. Thus, the end of chapter review or summary is also an aspect of the content evaluation of textbooks, which should not be ignored. There is a need to determine summaries of basic science textbooks under evaluation.

It is sometimes desirable in education to measure the difficulty level of a particular text in relation to the class for which it is assigned. One of such measures can be topical coverage is content and chapter summary. The topical coverage provides an estimate of the extent to which the content of a text covers the prescribed curriculum or syllabus. It is an average of what might be called "surface coverage" and "depth coverage" while surface coverage is proportion of topics in the curriculum or syllabus covered by a textbooks, depth coverage is the depth of treatment given to those topics.

Chapter summaries index, provides an estimate of the extent to which the chapter summaries promote a more permanent understanding of the content of the text. It is defined as the difference in the proportion of sentences in the chapter summaries which promote more permanent learning and transfer and those which are mere repetitions of the materials of the chapter.

2. Objectives of the Study

The objectives of this study are to evaluate basic science textbooks in Ebonyi State junior secondary schools. Specifically, this study seeks to:

- Find out how the contents of the basic science textbooks cover the contents specified in the core -

curriculum.

- Examine the appropriateness of the chapter summary of each of the basic science textbooks.

3. Research Questions

The following research questions guided the study

- How do the contents of basic science textbooks in Ebonyi State junior secondary schools covers the contents specified in the core-curriculum?
- How appropriate are the chapter summaries of each of the basic science textbooks in Ebonyi State junior secondary schools?

4. Hypothesis

The following null hypothesis was tested at an alpha level of 0.05

- The contents of the basic science textbooks do not deviate from the specification of the core-curriculum

5. Method

The study employed evaluation research design. Evaluation study according to Ali (2006) is the type of design that makes use of value judgment on programmes or project based on certain pre-determined criteria.

The researcher deemed this design very useful because it involves making value judgment about basic science textbooks in Ebonyi State junior secondary schools. The study was carried out in Ebonyi State of Nigeria. The study covered the three Education Zones of Ebonyi State, Abakaliki Onueke and Afikpo.

The population comprised all approved basic science textbooks in Ebonyi State junior secondary schools. They were fifty one (51) in all. Simple random sampling technique was used to draw twelve (12) basic science textbooks out of fifty one (51) that was approved for Ebonyi State junior secondary schools. A 5-point quantitative approach for content evaluation of science textbooks (QACEST) was the instrument used for the data collection. The instrument was developed by Nworgu (1988). The instrument adopts a set of 5 criteria which includes; topic coverage, learning activity, study questions, illustration and chapter summary.

QACEST formula was used to answer the two research questions. The hypothesis was tested at 0.05 level of significance using chi-square test of goodness of fit.

6. Results

Based on the data collected, the index of topical coverage (ITC) was calculated and presented in the table 1 below.

Table 1: Index of Topical Coverage

Textbooks	JSS	Tt	St	Ts	Ss	Index
STAN Nigerian basic science project	1	19	64	19	65	0.99
	2	25	80	25	85	0.97
	3	19	75	22	77	0.92
Basic science for Nigerian junior secondary schools	1	Not inline with the		19	65	No index
	2	basic science core		25	85	None index
	3	curriculum		22	77	No index
Spectrum basic science for junior secondary schools	1	17	61	19	65	0.91
	2	21	65	25	85	0.80
	3	20	69	22	77	.90
Upper basic science for junior secondary schools	1	19	66	19	65	1.00
	2	23	87	25	85	.97
	3	22	8779	22	77	1.01

The data in table 1 revealed the ITC index scores for the twelve (12) basic science textbooks evaluated.

For STAN Nigerian basic science project for JS I, JS II and JS III, were 0.99, 0.97 and 0.92 respectively. For basic science for Nigerian junior secondary schools, the ITC index score for JS I, JS II and JS III is zero (0) respectively. This is because the textbooks area not in line with the basic science core curriculum. For spectrum basic science, the ITC index score for JS I, JS II and JS III were 0.91, 0.80, and 0.90 respectively while that basic science for upper basic, the ITC index score for JS I, JS II and JS III were 1.00, 0.97 and 1.01 respectively.

The chapter summary index for the twelve (12) basic science textbooks are presented below.

Table 2: Chapter Summaries Index

Textbooks	JSS	N	R	Index
STAN Nigeria Basic Science Project	1	57	31	.29
	2	51	36	.17
	3	70	39	.28
Basic science for Nigerian junior secondary schools	1	None	None	None
	2	None	None	None
	3	None	None	None
Spectrum basic science for junior secondary schools	1	56	32	0.20
	2	50	39	1.12
	3	50	37	0.15
Upper basic science for junior secondary schools	1	60	33	0.29
	2	60	31	0.32
	3	60	30	0.33

Data on table 2 above showed the chapter summary index for twelve (12) basic science textbooks approved in Ebonyi State junior secondary schools. For STAN Nigerian basic science project, the chapter summary index (CSI) was 0.29, .17 and .28 for JS I, JS II and JS III respectively. For basic science for Nigerian JSS the CSI was zero (0) while spectrum basic science was 0.20, 0.12 and 0.15 respectively. The CSI of basic science for upper basic was also 0.29, 0.32 and 0.33 respectively. The result of the study showed that all basic science textbooks studied do not have appropriate chapter summary and basic science for JSS textbooks do not have chapter summary at all.

Table 3

7. Hypothesis

H_{01} : The contents of the basic science textbooks approved in Ebonyi State junior secondary schools do not significantly deviate from the specification of the core-curriculum,

The contents in the STAN Nigerian basic science project series JSI, JS II and JS III were matched with the content specified in the core-curriculum. The frequencies were subjected to a chi-square test of goodness of fit. The summary is presented in the table 3 below.

Table 3: Chi-square Table on Significance of Deviation of Textbook Content from Specification of Core-Curriculum (STAN Nigerian Basic Science Project JS I, JS II and JS III).

Content	JS I	JS II	JS III	χ^2_{cal}	Alpha	χ^2_{crit}	Dec.
You and environment	(34)	(18)	(26)	1.2957	0.05	18.307	Accept
	31	19	27				
Living and non-living things	(12)	(34)	(21)				
	13	36	21				
Science and development	(06)	(07)	(06)				
	07	08	06				
You and energy	(12)	(21)	(22)				
	14	22	23				

The chi-square calculated value is 1.2957 while the critical at alpha level of 0.05 is 18.307. Based on the decision rule, the researcher accepts the null hypothesis and concluded that the content of STAN Nigerian basic science project do not significantly deviate from the specification of the core curriculum.

Table 4: Chi-square Table on Significance of Deviation of Textbook Contents from the Specification of Core-Curriculum (Spectrum Basic Science JS I, JS II and JS III)

Content	JS I	JS II	JS III	χ^2_{cal}	Alpha	χ^2_{crit}	Dec.
You and environment	(30)	(14)	(25)	14.1288	0.05	18.307	Accept
	31	19	27				
Living and non-living things	(12)	(30)	(19)				
	13	36	21				
Science and development	(06)	(03)	(04)				
	07	06	06				
You and energy	(13)	(18)	(21)				
	14	22	23				

The contents of spectrum basic science were matched with the content specified in the core-curriculum. The

frequencies were subjected to a chi-square test of goodness of fit. The result as shown above, the chi-square calculated value is 14.1288 while the critical value of alpha level of 0.05 is 18.307. Based on the decision rule, the researcher accepts the null hypothesis and conclude that the content of the spectrum basic science textbooks do not significantly deviate from the specifications of the core-curriculum.

Table 5: Chi-square Table on Significance of Deviation of Textbooks Content from Specification of the Core- Curriculum (Basic Science for Upper for JS I, JS II and JS III)

Content	JS I	JS II	JS III	χ^2_{cal}	Alpha	χ^2_{crit}	Dec.
You and environment	(32) 31	(19) 19	(28) 27				
Living and non-living things	(12) 13	(37) 36	(22) 21				
Science and development	(07) 07	(09) 08	(07) 06	.7648	0.05	18.307	Accept
You and energy	(15) 14	(22) 22	(22) 23				

The contents of basic science for upper basic textbooks were matched with the content specified in the core-curriculum. The frequencies were subjected to a chi-square test of goodness of fit. As shown in the above result, the chi-square calculated value is .7648 while the critical value of alpha level of 0.05 is 18.307. Based on the decision rule, the researcher accepts the null hypothesis and concludes that the contents of the basic science for upper basic textbooks do not significantly deviate from the specifications of the core-curriculum.

For basic science for Nigerian junior secondary schools for JS I, JS II and JS III. No chi-square table on the significance of deviation. The reason being that the textbooks were not in line with the basic science core-curriculum for junior secondary schools. The textbooks did not take notice of the four themes that covered knowledge, skills and attitudinal requirements like; you and environment, living and non-living things, science and development and you and energy.

8. Conclusion

Based on the findings, the following conclusions were made.

- Out of twelve basic science textbooks studied, only nine basic science textbooks in Ebonyi State junior secondary schools closely reflect the contents specified in the core-curriculum. Thus those nine basic science textbooks in Ebonyi State junior secondary schools have acceptable content validity.
- STAN basic science textbooks I, II and III had inadequate chapter summary index, spectrum basic science textbooks I, II and III and basic science for upper basic textbooks I, II and III had inadequate chapter summary index, while basic science for junior secondary schools textbooks had no chapter summary at all. Therefore, basic science textbooks for junior secondary schools cannot be considered adequate in terms of chapter summary.

9. Recommendations

Based on the findings and conclusions of this study the following recommendations were made.

- All basic science textbooks used for teaching students need to be periodically revised with the view to make them to have acceptable content validity and enrich them in terms of content and chapter summary. A good chapter summary promotes a more permanent understanding of the content of the text. It equally promotes more permanent learning and transfer.
- Authors and publishers of any basic science textbooks should consult basic science core-curriculum in order to draw topics, objectives, contents and activities from the core-curriculum.
- Selection and recommendation of basic science textbooks for teaching and learning should be done by experts in the area like science teachers, curriculum experts, parastals, e.g. SUBEB, SEB, library and scholarship boards based on acceptable criteria.
- All basic science textbooks should be properly evaluated before recommending them to any class level particular attention should be paid to content and chapter summary of the textbooks for the intended class level.

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