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## RESEARCH ARTICLE

# TRANSLATING THE EVALUATION GUIDE OF THE BASIC SCIENCE CURRICULUM INTO ACTION

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### ABSTRACT

The professional knowledge and skills possessed by most teachers for translating the evaluation guide of Nigeria's 9-year Basic Education Curriculum (BEC) into action in the classroom is in doubt. This work set out to ascertain teachers' knowledge and skills to frame suitable questions using the Basic Science curriculum evaluation guide. The study shows that Basic Science teachers have adequate knowledge and skills to frame suitable questions, or give instructions that will help students in 33(53.23%) of the items of Basic Science teacher guide for students' evaluation; inadequate knowledge and skills to frame suitable questions, or give instructions that will help students provide answers relating to items in 29 (46.77%) of the items of Basic Science teacher guide for students' evaluation. Necessary skills and knowledge that are required of teachers for proper translation of the evaluation guide of Nigeria's 9-year BEC into action in the classroom are examined.

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## INTRODUCTION

Evaluation is a very important component of the teaching-learning process. The teaching-learning process is complex and its outcome is best evaluated using a variety of techniques and broadly based criteria. Educators emphasize that different domains of learning (cognitive, affective and psychomotor) should be evaluated during and after every lesson/instruction (Nkemakolam, 2003; Slavin, 1991).

In the words of Ochoche (2008), the teaching process is not complete without one form of evaluation or the other. This is necessary because, learners come from diverse background and have different levels of preparedness. These conditions place some learners at advantage or disadvantage over another. It is therefore necessary that teachers should establish a balance between these groups of learners through the use of appropriate evaluation instruments and strategies, which very often are suggested in the curriculum by the planners. However, some of the teachers in the schools system who are expected to interpret correctly and implement the curriculum provisions do not seem to possess the skills to do so, and for developing assessment instruments, and understanding of both the performance objectives and evaluation guide. This is worrisome.

Evaluation involves making judgments about the quality, value, or worth of a response, product, or performance based on established criteria. Evaluation is accomplished through the use of assessment instruments. Evaluations provide information (i) to students, and their parents/guardians where applicable, about the progress they are making towards attaining the knowledge, skills and attitudes to be learned; and (ii) various personnel who make educational decisions with regard to (instructional, diagnostic, placement, promotion, graduation, curriculum planning, program development, policy) about students (Alberta Education, 2006; Nworgu, 2003).

Theobald, Umar, Ochekepe and Sanni (2007) observed that the current Basic Science curriculum did not provide sufficient guidance on approaches to assessment. The authors argued that assessment is only covered in methods modules of the primary teacher training courses and there is little further support to teachers on assessment from State Education Resource Centres (ERC), State Universal Education Boards (SUBEBs), State Inspectors of Education (SIE) or Local Government Education Authority (LGEA) supervisors. The authors point to the fact that something needs to be done in order to properly translate the evaluation guide of the basic science education curriculum as intended by the curriculum planners. Proper translation of the evaluation guide requires that the teachers who implement the curriculum in schools should be able to do so. The teachers

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should be competent, which implies that they should have the necessary and requisite skills and knowledge. Piaget (1971) explains that the foundations of knowledge are in action. Okorie & Akubuilo (2013) opined that this can be explained in terms of action towards acquisition of knowledge or in its utilization. The authors explained that an act based on the information gained by the individual through learning or experience expresses that individual's knowledge about the given subject or situation. They asserted that teachers' knowledge of the curriculum should be assessed and ascertained by how they act upon it, in terms of correct interpretation of its philosophy and objective, proper implementation of its content in line with the recommended approach to concept delivery and learning evaluation.

The 9-year basic education curriculum provides the official statement of intent, showing what teachers will teach and students/pupils will learn in all subjects from primary 1 to junior secondary 3 in Nigeria.

#### ***Performance (learning) Objective and 9-year Basic Education Curriculum***

It could be argued that the quality of human development is defined by the quality of education and experience received by individuals. It is in realization of this fact that Nigeria's National Policy on Education (FGN, 2004) asserted that no educational system can rise above the quality of its teachers. Joshua, Joshua and Maliki (2007) observed that at the school level, the quality of education available to pupils is largely determined by the quality of teaching that goes on in the classrooms. Okorie (2012) opined that each society needs competent science teachers in the education system to lay a strong foundation that will enable young learners study, enjoy and grow up to become life-long learners of science. The quality of teaching/learning is greatly enhanced with good measurable performance (learning) objective and evaluation guide. Performance (learning) objective is a statement that clearly and precisely describes what the student is expected to accomplish during and after a lesson or instruction. It is a specific statement of what learners will be able to perform at the conclusion of an instructional activity. Each performance (learning) objective involves new learning, expanded growth or improvement on a concept (as can be seen in most topics of the 9-year BEC). Generally, learning objectives are competency-based because they designate exactly what students need to do to demonstrate mastery of course materials.

#### ***The purpose of learning objectives***

##### ***The purpose of learning objectives include to***

1. facilitate overall subject development by encouraging goal-directed planning;
2. inform students of the standards and expectations of the subject;
3. provide information for the development of assessments by identifying the types of evidence that students need to produce to demonstrate understanding;

4. clarify the intent of instruction and guide the formation of instructional activities (resource/text selection, instructional methods, etc);
5. provide a framework for evaluating student performance and progress;
6. serve as an implicit contract between instructor and students setting up a basis for accountability;
7. drive curriculum planning;
8. create a framework for evaluating overall effectiveness of an educational program;
9. provide evidence of student learning to be utilized for accreditation.

The understanding/firm grasp of subject and the performance (learning) objective of the 9-year basic education curriculum by teachers is the first step towards translating the BEC into action. Once the teachers know the performance objective, they can then develop appropriate instruments or select from already existing ones to assess and evaluate the students.

#### ***Assessment and Evaluation of Students' Learning and the 9-year BEC***

Assessment is the act of collecting information about students or learners, used in making an evaluation about the progress and development of the learners. Teachers use classroom assessment instruments, developed, adopted or adapted by them, in their classrooms to determine the progress and achievement of students, in terms of their knowledge, skills, and attitudes. Results obtained from such assessments help teachers to refine their own instruction. The strategy or technique teachers employ to assess and evaluate students is by obtaining relevant data through several means including observations, anecdotal notes and records, text- and curriculum-embedded questions and tests; paper-and-pencil tests, computer adaptive and on-line tests, oral questioning, interviews, peer-and self assessments, standardized criterion-referenced and norm-referenced tests, and performance assessments (e.g., writing samples, exhibitions, portfolio assessment, and project and product assessments). Assessment method is used to encompass all the strategies and techniques that are employed to gather information from students about their progress toward attaining the knowledge, skills, and attitudes taught (Arter, 2009).

To educate students effectively is to provide students with the opportunity to reach their potential and contribute to society. This can only happen if teachers and others who work with students obtain data and information about how each student is progressing, what the student knows and can do, and what must be done to further develop and encourage the student's educational development. Assessment and evaluation of student help all who are engaged in the educational process of the learner make more informed decisions. Credible assessments and evaluations help students to know what knowledge, skills, and attitudes they have acquired and where they have areas of need. Students and their parents/ guardians need evaluative information to help them set goals, identify the students' strengths that can be built upon and areas of weakness that need to be addressed.

**Table 1** Mean responses of teachers on their skills and knowledge to frame suitable questions using Basic Science curriculum evaluation guide

	<b>Skills and knowledge to frame suitable questions or give instructions that will help students</b>	<b>Mean</b>	<b>SD</b>	<b>Remark</b>
1.	identify things in and around the school and home	2.87	0.53	AD
2.	sort things into living and non living things	2.56	0.91	AD
3.	sketch two things collected	2.31	0.84	IN
4	name three types of soil	2.63	0.47	AD
5	show that air exists	2.23	0.98	IN
6	demonstrate that air occupies space	2.44	0.72	IN
7	name five common sources of water	2.94	0.65	AD
8	mention three uses of water	2.67	0.62	AD
9	recite poem about water and its uses	2.37	0.75	IN
10	define technology	2.26	0.63	IN
11	Identify five colours	2.81	0.77	AD
12	state the meaning of simple machines	2.39	0.53	IN
13	identify three simple machines in the school	2.86	0.78	AD
14	identify three simple machines in the home	2/33	0.82	IN
15	identify and match objects based on colours, shape and size	3.02	0.98	AD
16	identify and describe sounds made by different objects; animals and persons	2.80	0.99	AD
17	differentiate between smooth and rough objects, hard and soft objects, cold and warm things	3.27	0.87	AD
18	describe low tings taste (e.g. sweet, bitter, salty).	2.33	1.02	IN
19	name two instrument for measuring length	3.17	0.94	AD
20	state the metric units of length	2.73	0.49	AD
21	measure correctly the length breadth, and height of objects in the classroom	3.02	0.98	AD
22	record measurement correctly including units	2.84	0.96	AD
23	name the instrument for measuring mass	2.73	0.58	AD
24	state the metric units of mass	2.18	0.49	IN
25	use lever-arm balance to estimate the masses of objects in the classroom and record their findings etc	2. 06	1.22	IN
26	name two instrumentsfor measuring weight	2.67	0.70	AD
27	Draw both round and square objects	2. 67	0.62	AD
28	explain the meaning of change	2.23	0. 96	IN
29	describe changes around them	2.73	0.58	AD
30	give four examples each of permanent and temporary changes	2.37	0.49	IN
31	state four differences between temporary and permanent changes	2.36	1.22	IN
32	name four different types of teeth in the mouth	2. 17	0.70	IN
33	identify and locate the position of each type of teeth in the mouth	2.47	0.63	IN
34	state the uses of the different types of teeth in feeding	2.31	0.86	IN
35	describe the role of the lips and the tongue in feeding.	2.27	0.79	IN
36	name and identify parts of a flower	2.33	0.75	IN
37	list the type and agents of pollination	3. 01	0.55	AD
38	list the changes that occur at different stags of development from flower to fruit	2.67	0.57	AD
39	distinguish between pollination and fertilization in flowering plant	2.66	0. 66	AD
40	draw a hibiscus flower and label its parts	2.93	0.78	AD
41	list three types of materials used in technology	2.23	1.22	IN
42	state three uses of each of the following : (wood, metal, plastic)	2.28	0.97	IN
43	define energy conversion	2.22	0.99	IN
44	list three form of energy conversion	2.21	0.96	IN
45	list three importance of energy conversion	2.22	0.96	IN
46	demonstrate one form of energy conversion	2.16	0.95	IN
47	identify five types of naturally occurring and synthetic drugs	2.16	0.97	IN
48	identify and name three food substances that are drugs	2.15	0.97	IN
49	mention three effects of ingesting large amounts of food substances that are drugs	3.26	0.89	AD
50	group drugs as: synthetic and naturally occurring	3.29	0.82	AD
51	identify and name three common fertilizers	3.03	0.95	AD
52	use chemical and compost fertilizers to grow crops	3.19	1.00	AD
53	compare the effect of chemical fertilizers and compost one	3.57	0.72	AD
54	name five materials for door making	3.28	0.81	AD
55	produce simple door mat	3.22	0.84	AD
56	state three marketing strategies	2.69	1.11	AD
57	draw a circle	3.13	0.99	AD
58	draw horizontal lines	3.41	0.77	AD
59	draw vertical lines	2.59	0.98	IN
60	define force	2.25	0.98	IN
61	give three examples of force	2.19	0.98	IN
62	describe effect of force on materials	2.13	0.95	IN
	Total	2.60	0.80	AD

N=400, AD = Adequate, IN = Inadequate

Teachers need assessment and evaluation results to assist them to plan, implement, and revise their classroom instruction. They also use these results to better meet the needs, often diverse, of their students, identify scholarship recipients, and advise students on what courses to take for career planning.

For these reasons, the Senate Committee on Teaching and Learning (2002) insists that teaching/ learning process models require teachers to ‘base their decisions – instructional, grading, and reporting – on some knowledge of student progress toward’. The Committee observed that teachers’ task

of assessment and evaluation of student learning is most demanding and complex because teachers use their professional judgment to ensure that their assessments are relevant to and representative of the learning outcomes their students are expected to achieve. They use informed professional judgment to assess and evaluate the amount of learning taking place during instruction, construct items and tasks, decide if alternate items/tasks are needed for students with special needs, score and interpret the responses of their students, provide descriptive feedback, prepare summary comments and grades, and communicate to students, their parents/guardians and others who have a right to know.

**Evaluation Guide and Proper Assessment**

The 9-year BEC provides Nigerian teachers with a clear statement of performance objective, evaluation guide, content, topic, and teachers’/pupils’ activities. If the teachers plan and implement their instruction effectively, assess and evaluate students’ progress continuously and accurately, and make students believe that relevant and important targets are achievable, then the teachers would greatly motivate students to grow and develop themselves. Students are motivated to learn when the instruction they receive and the assessment and evaluation tests they take are clearly aligned to the learning outcomes and provide information that can be used to design follow-up learning opportunities for them; and if the outcome of such tests would provide their parents/guardians, and others with legitimate information about what they know or need to know.

**RESEARCH METHOD**

Descriptive survey design was adopted for this study. The study was carried in Enugu State, Nigeria. All the Basic Science teachers in Enugu State formed the population of the study. The population size is about 400 Basic Science teachers in states. Through purposive/simple random sampling technique, 400 Basic Science teachers were sampled for the study. The sample comprised of 200 males and 200 female Basic Science teachers.

**The instruments**

**Two instruments:** Basic Science teacher guide for students’ evaluation (BSTGSE) questionnaire and Basic Science evaluation techniques (BSET) Scale were developed by the researchers and used in collecting data from the teachers.

The instruments consist of 62 items and 9 items respectively. Three experts in Science Education, measurement and evaluation, from the University of Nigeria, Nsukka, validated the instrument. The reliability of the instruments was established using the Crobach’s alpha procedure and the coefficient of 0.84 for BSTGSE and 0.72 BSET were obtained. The questionnaire and evaluation scale were administered to the sampled Basic Science teachers in their respective schools by the researchers and some assistants. The entire questionnaire was returned as they were filled and collected back at spot. Mean ( $\bar{X}$ ), standard deviation (SD) and percentages were used in data analysis.

**RESULT**

The result of the study is presented in Tables 1 and 11.

**DATA ANALYSIS AND DISCUSSION**

The analysis and discussion are carried out in line with the research questions.

**Question 1:** *What are the mean responses of teacher on their skills and knowledge to frame suitable questions using Basic Science curriculum evaluation guide?*

Table 1 shows that Basic Science teachers have adequate skills and knowledge to frame suitable questions or give instructions that will help students provide answers relating to items 1, 2, 4, 7, 8, 11, 13, 15, 16, 17, 19, 20, 21, 22, 23, 26, 27, 29, 37, 38, 39, 40, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, and 59. All the 33 items have mean values ranging from 2.56 to 3.41. These mean values were all above the criterion mean value of 2.50. This means that Basic Science teachers have adequate skills and knowledge to frame suitable questions or give instructions that will help students in 33(53.23%) of the items of Basic Science teacher guide for students’ evaluation. Table 1 also shows that Basic Science teachers have inadequate skills and knowledge about how to frame suitable questions or give instructions that will help students provide answers relating to items 3, 5, 6, 9, 10, 12, 14, 18, 24, 25, 28, 30, 31, 32, 33, 34, 36, 41, 42, 43, 44, 45, 46, 47, 48, 60, 61 and 62. All the 29 items have mean values ranging from 2.13 to 2.47. These mean values were all below the criterion mean value of 2.50. This means that in 29 (46.77%) of the items of Basic Science teacher guide for students’ evaluation, teachers have inadequate skills and knowledge

**Table 2** Frequency and percentages of the evaluation techniques used by Basic Science teacher.

Evaluation Techniques	Very Often		Often		Sometimes		Rarely	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Test( Objective/Essay)	235	74.60	65	20.64	15	4.76	0	0.00
Oral Test	120	38.09	135	42.86	40	12.70	20	6.35
Checklist	30	9.52	45	14.29	30	41.27	110	34.92
Rating Scale	10	3.17	15	4.76	135	42.86	155	49.21
Homework/Assignment	180	57.14	90	28.57	30	9.52	15	4.76
Project	165	52.38	120	38.08	25	7.94	5	1.59
Regular writing during instruction	230	73.02	60	19.05	15	4.76	10	3.17
Quizzes	175	55.56	95	30.16	35	11.11	10	3.17
Questionnaire	5	1.59	20	6.35	55	17.46	235	74.60

**Question 2:** What are the Frequency and percentages of the evaluation techniques used by Basic Science teacher in evaluating students?

Table 2 revealed that the technique very often used by Basic Science teachers in evaluating students is test (74.60%). This is followed by Regular writing during instruction (73.62%), Homework/Assignment (57.14%), Quizzes (55.56%), Project (52.38%), Oral Test (38.09%), Checklist (9.52%), Rating Scale 3.17 and the least being Questionnaire (1.59%). The percentage based on often used techniques were 20.64%, 42.86%, 14.29%, 4.76%, 28.57%, 38.08%, 19.05%, 30.16% and 6.53% for test (objective/essay), Oral Test, Checklist, Rating Scale, Homework/Assignment, Project, Regular writing during instruction, Quizzes and Questionnaire respectively. Table 1 also show that the percentage based on sometimes used techniques were 4.76%, 12.70%, 41.27%, 42.86%, 9.52%, 7.94%, 4.76%, 11.11% and 17.46% for test (objective/essay), Oral Test, Checklist, Rating Scale, Homework/Assignment, Project, Regular writing during instruction, Quizzes and Questionnaire respectively. The percentage based on rarely used techniques were 0.00%, 6.35%, 34.92%, 49.21%, 4.76%, 1.59%, 3.17%, 3.17% and 74.60% for test (objective/essay), Oral Test, Checklist, Rating Scale, Homework/Assignment, Project, Regular writing during instruction, Quizzes and Questionnaire respectively.

## DISCUSSION

The result of this study shows among others that Basic Science teachers have inadequate skills and knowledge about how to frame suitable questions or give instructions that will help students provide answers relating to 46.77% of the items in Basic Science teacher guide for students' evaluation. This perhaps accounts for the failure rate in students' poor performance in both school and junior school certificate examination. The report of vision 2020 National Technical Working Group on education sector (2009) shows that, the quality assurance mechanisms of primary school are weak despite the many inspection services of the federal, state and local levels. The report indicated that, many pupils failed to reach the minimum standard. The minimum standard of pupil can be enhanced by teachers through effective use of evaluation guide.

Evaluation guide is a companion to the teacher. It provides teachers guidance on how learning might be fairly and effectively assessed. It aligns the curriculum content with performance objectives and in ensuring that the assessment methods are compatible with the intended outcome. This way, evaluation guide serves as a tool for quality assurance. When it is effectively used, it helps the teacher in decision-making and ensures that the decision made about students' learning or instructional procedures are valid and reliable. Any teacher who effectively uses the evaluation guide will likely turn out quality students/pupils.

## Recommendation

The following steps should be taken by classroom teachers in order to translate the evaluation guide of the 9-year basic education curriculum into action.

- The teachers need to be equipped and encouraged to acquire enough and sufficient skills and knowledge for effective assessment and evaluation of students' academic progress. Continuing professional development programme for Basic Science teachers should concentrate on training the teachers towards proper and efficient assessment evaluation of students' learning.
- The learning outcomes students/pupils are expected to achieve should be identify in advance.
- The teacher should be helped to develop, adopt or adapt appropriate assessment methods that yield valid and reliable result. The teachers should be able to diagnose students' strength and area of weakness.
- Students should be given a feedback on their Performance
- The teacher should be able to modify the performance objectives in the evaluation guide, were necessary.
- Purpose of assessment, intended learning outcomes and instructional approach should be compatible with assessment and evaluation tests.
- Teachers should ensure that the assessment items/task are relevant and appropriate to both content and all educational domains (cognitive, affective and psychomotor).

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