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Assessment of Candidates' Educational Performance in Integrated Science at the Basic Education Certificate Examination (BECE), in Sierra Leone, 2005-2007, Implications for Stakeholders

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Abstract:
The study assessed the educational performance of candidates in integrated science at the Basic Education Certificate Examination (BECE) between 2005 and 2007 in Sierra Leone, and its implication for stakeholders. Descriptive research survey design was adopted in the study. The target population comprised of200 junior secondary schools that presented candidates for 2005-2007BECE in Sierra Leone, junior secondary school pupilsth at have been in the schools for at least two years and attempted integrated science at BECE between 2005 and 2007 in Sierra Leone, Integrated Science Teachers and Integrated Science Heads of Department. Sample consisted of 100 junior secondary schools, chosen by stratified random sampling technique. The instrument used to collect information on performances of candidates was the Basic Education Certificate Examination results for 2005-2007.Data was analysed using frequency counts and percentages through Statistical Package of Social Sciences (SPSS) software. Results obtained were displayed on bar charts and line graphs .Findings revealed among others, unsatisfactory performance of candidates in integrated science at BECE between the periods 2005 and 2007. Based on the findings, it was recommended that: government to regularly monitor and supervise teaching and learning process in junior secondary schools in all regions and districts of the country; principals to adopt evaluation strategy for teachers by preparing annual performance appraisal form for every teacher in the schools and also take record of class attendance of pupils, in order to evaluate the teaching/learning process of integrated science in the schools; government to provide adequate and up to date teaching and learning materials to the schools; school employers to employ more science graduates to teach in the BECE classes; government to construct more schools and refurbish the old ones in each of the districts to reduce congestion of classes; government through MEST to organize workshops, seminars, conferences and in-service training to improve on the science teachers' pedagogy.

Keywords: *Assessment, academic performance, candidates, passes, failures, integrated science, public examination*

1. Introduction

1.1. Background to the Study

Assessment ofpupils' academic achievement is pivotal in evaluating pupils in the Sierra Leonean schools. The West African Examinations Council serves as Africa's foremost examination institution established by law and operating in five West African countries(Ghana, Liberia, Gambia, Nigeria and Sierra Leone). WAEC replaced the Cambridge School Certificate. It is an institution charged with the sole responsibility of organizing and conducting secondary schools' public examinations in these West African countries. In each of these West African countries, there are WAEC head quarters. In Accra, Ghana is the WAEC headquarters, Nigeria has its headquarters in Yaba, SierraLeone has its national headquarters at Tower Hill, Freetown, the Gambia has its headquarters in Banjul and Liberia, the head quarter is situated at Congo Town, Monrovia.

There are two main public examinations conducted by WAEC in Sierra Leone. They are:1) Two national examinations; i) National Primary School Examination (NPSE)) ii) Basic Education Certificate Examination (BECE)) and an International examination -West African Senior School Certificate Examination (WASSCE).

Educational assessmentisa tool in evaluating the overall performance of pupils in Sierra Leone educational system. In teaching and learning integrated science, much emphasis is laid on assessment of pupils, as it provides feedback on pupils 'academic performance. There are two major types of educational assessment. These are: i) Formative assessmentand ii)summative assessment. Formative assessment occurs during an instructional programme while summative assessment takes place at the end of an instructional programme.

According to Inyang (2005), there are different types of assessment namely; written assessment, assessment of practical abilities and on the spot assessment. Written assessment includes essay and objective test items. Assessment of

practical abilities is based on the end results but an effective assessment of these abilities is one which takes into account all the processes involved. Thus,one activity in science practical which merit assessment is comprehending the instrument.

Feedback helps students find out how well they understand the new material, what they have done correctly and what their errors are (Joyce et al, 2000a).

Gbamanja (1992) outlined the following as some of the reasons why we assess:

- to improve education whether to help a curriculum project, develop its materials or to help a teacher develop his own teaching
- to determine the effectiveness of a programme, its strength or limitations.
- to defend and to reassure.
- to get vital information about the learners' behavior.

According to him, a teacher does not complete the instructional task until he/she has determined the performance of his/her pupils. He listed the following as assessment methods used in integrated science

- Test and examination
- Questionnaires
- Classroom Observations
- Oral Questioning
- Interview

Test/examinationis a measuring device in which the person provides samples of his or her own behaviour by answering questions or solving problems. The purpose of tests and examinations are:

- they serve as teaching instrument
- they act as instrument of assessment.

Basically, there are two types of test; these include essay test items and objective test items. Essay test items are further divided into two, namely: free response essay and restricted essay. All of these are used by Integrated Science teachers to assess the performance outcome of their pupils.

Questionnaires and Interviews: These two assessment methods play important role in obtaining information from pupils especially their project work.

Observation on the other hand takes into consideration the five senses, these include: Seeing, tasting, smelling, touching and feeling.According to Gbamanja (1992), assessment technique focuses on problems as they arise.

Martin (1995) emphasizes on school assessment of pupils and asserts that assessment should enable a teacher to make a statement about a child's learning and understanding. He was able to distinguish between assessment and evaluation that assessment measures a pupil's progress while evaluation judges the merits of an individual of an educational system. Assessment of the individual is therefore part of evaluation but evaluation also considers the role of the teacher and the effectiveness of the curriculum. There are varieties of reason why teachers assess. Among these are:

- For grading
- To stimulate competition and provide motivation
- For diagnostic and guidance purposes
- To evaluate procedures whereby teaching can be modified
- For selection and prediction. Martin (1995)

Martin (1995) further identified the following modes of assessment:

- formal and informal assessment,
- formative and summative assessment,
- subjective and objective assessment,
- continuous and terminal assessment,
- norm –referenced and criterion-referenced assessment
- convergent and divergent assessment

Kyalo (2005), in a paper presented on the third SMASSE – WECSA third Country training programme at the Centre for Mathematics, Science and Technology Education in Africa (CEMASTA) on the topic "The role of assessment in the teaching/learning process with specific reference to assessment in Mathematics and Science", in his introduction, he reiterated that, 'in any educational system, instruction is incomplete without assessment. Whether assessment is conducted in a classroom or at national level, the primary purpose of any form of assessment is to measure learning attainment levels. If assessment is properly used, whether external or institutional based, it can serve as a tool for enhancing the quality of teaching and learning'. He defined assessment as a process for obtaining information that could be used for making decisions about

- Students knowledge, attitude and skills
- Curricula
- Policy in education
- Teaching strategies

He presented methods of assessment on the note that assessment of attainment may include the use of a number of different methods which can be categorized into two main groups.Formative assessment method– this includes teacher made test, exercises, assignment, aural (listening) and oral (speaking) test. Formative assessment is an integral part of the teaching/instructional programme in the classroom where there is an opportunity to respond to it.

Summative assessment method – this refers to test administered at the end of learning cycle leading to the award of certificates. Kyalo (2005).

Kyalo (2005) asserted that in an educational system, assessment of students' learning in the classroom by teachers occupies a central role in the teaching/learning process and is an essential component of classroom work.

Continuous assessment is another mode of assessment of pupils in integrated science. Continuous Assessment possesses five main characteristics: it is systematic; it is comprehensive; it is cumulative; it requires the use of a variety of evaluation techniques to take account of all domains; it is guidance oriented. Gbamanja (1992).

Continuous assessment is important for the following reasons:

- It gives the classroom teacher greater involvement in the overall assessment of his or her pupils;
- To provide a more valid assessment of the child's over all ability and performance;
- To enable teachers to be more flexible and innovative in their instruction
- To provide a basis for more effective guidance of the pupils;
- To reduce examination malpractices.

Continuous assessment in integrated science can be done in four main areas:

- by examining the theory
- by examining the practical
- by making use of science projects
- by using out-of-school scientific activities(Gbamanja, 1992)

According to the Handbook for Junior Secondary Schools (1994), there are four methods of assessment in integrated science:

- Continuous Assessment
- Written Examination
- Practical Examination
- Oral/Aural Examination

Three modes of assessment are used with a combination of the four methods above. These modes are as follows:

Mode A

- One written paper of two parts incorporating multiple choice objective items and short answer/structured questions or calculations.
- Continuous Assessment of theory and projects

Subjects examined using Mode A, are as follows:

1) Business Studies
2) Mathematics
3) Religious and Moral Education
4) Social Studies

Mode B

- One written paper of two parts incorporating multiple choice objective items and short answer/structured questions or calculations
- Continuous assessment of theory and practical work.

Subjects examined using Mode B, are as follows:

1) Agriculture
2) Creative Arts
3) Electronics
4) Home Economics
5) Integrated Science
6) Introductory Technology
7) Local Crafts
8) Physical and Health Education

Mode C

- One written paper of two parts incorporating multiple choice objective items and short answer/structured questions or calculation
- One written paper containing essay/continuous writing questions
- Oral/Aural assessment

Continuous assessment in theory and projects. Subjects examined using mode C, are as follows:

i)Arabic ii) French iii) Language Arts (English) iv) Sierra Leone Languages

Competence in written and spoken English, contributes to the final continuous assessment score for each subject. The appropriate grading of performance of each candidate in terms of assessment, for every subject offered, is graded as follows:

- Excellent –Grade 1
- Very good – Grade 2
- Good - Grade 3
- Credit - Grade 4
- Credit - Grade 5

- Pass - Grade 6
- Fail - Grade 7 (GOSL, 1994)

Continuous assessment at the BECE employs variety of different testing/monitoring procedures. They include; pencil and paper, class test of different types, homework/home assignments, pupils' observation, projects, investigations, questionnaires, practical and end of term examinations. Since all the schools use the same teaching syllabuses even if test content differs, it is important that assessment/marking be standard or uniform.

In terms of weighting consideration, continuous assessment accounts for a maximum of 20 percent of the end of year scores in each subject in the academic year of the Junior Secondary School internal assessment score while the summative exams (BECE) conducted by WAEC accounts for 80 percent. A very helpful and objective device in evaluating a pupil without reference to the relative performance of other pupils is the use of explicitly stated objectives each of which is accompanied by five to seven hierarchically arranged ' can do' criteria. The number of these criteria achieved by each pupil determines the extent to which he/she has mastered the objective and hence the score/grade obtained. This method of evaluation can be used to assess aptitudes, sporting prowess etc. that are not quantified. It also provides an explicit record of just what a pupil can do in a specified area.

Continuous assessment method/system of evaluation is not only dependent on the expertise possessed by the teacher but also on their integrity.

1.1.1. General Comments on Performance in Integrated Science at BECE Paper 200-2007

From the external examiner's report on the performance of pupils in integrated science in 2005 the paper within the required standard set in the syllabus and generally the candidates' performance were better than 2004. Individual questions reflected adequate coverage of physics, chemistry and biology aspects compounded in Integrated Science with no bias to any of the three options. Most of the questions in this year's paper required simple direct recall responses such as definitions, stating of functions characteristics etc. candidates performance was relatively better.

1.1.2. Candidates' Weaknesses in the BECE 2005-2007

From the Chief examiner's report, correct spellings of technical terms still evident in candidates' responses as in the previous years, to the extent that candidates cannot correctly transfer terms in the question paper to their answer sheets. There was carelessness in the use of correct units and some candidates did not follow the instruction given for individual questions. Pupils also displayed lack of knowledge of laboratory equipment.

There were generally poor expressions in English Language as most of theanswers were poorly represented and unclear. The examiner therefore recommended that teachers teaching integrated science are advised to let their students have a clear picture of the paper by clearly explaining the number of questions they are required to answer in sections B and C. Routine tests on spellings and important diagrams with correct labels in Biology and Physics must be practiced. Teachers should also endeavour where possible to familiarize students with common laboratory equipment and their uses. (Chief Examiners Report, 2005)

1.1.3. Challenges and Constraints in the Implementation of Assessment in the Classroom

Assessment systems in the classroom situation consist basically of tests, exercises and assignments constructed by class teachers. Tests, which are the most commonly used form of assessment in the classroom may be given at any time – weekly, monthly, in the middle of the term. As important as tests may be in enhancing the teaching/learning process, there exist a number of challenges and constraints that hinder their effective use. Some of these are as outlined below:

Large Class Size – in some cases, teachers have large number of pupils in their classrooms. This may pose a major problem when it comes to assessment of the pupils because teachers are expected to mark and keep records of the progress of their pupils.

Infective use of feedback information – teachers may successfully assess their pupils but one of the greatest challenge lies in the effective use of feedback

Poor quality tests – where teachers use written tests, many of the tests they develop may be wanting in quality. There are many teachers in schools who cannot apply the principles of assessment for diagnostic purposes because they were not given sufficient training.

Greater demands on teacher time – efficient assessment in the classroom situation means that the teacher spends more time marking, giving feedback to individual pupils, taking the necessary remedial action and maintaining up to date records. This, if not well co-coordinated, can take up most of the time available for actual teaching. Efficient covering of the syllabuses may be hindered if assessment takes up too much time.

1.2. Statement of the Problem

Assessment of pupils'educational performancein Sierra Leonean schools especially the category of pupils who complete the junior secondary school level of educationof the 6-3-4-4 system is through internal and external assessments. The internal assessment is done through the administration of a Teacher-made test while the external assessment is through the administration of the Standard Achievement Test. This type of test is usually designed by subject experts asit has national or international marking scheme.The educational performance of pupils is also influenced by determinant factors such as: the quality and attitude of the teacher, the location of the school, type of school, parental involvement and the attitude and motivation of the pupils themselves.

According to Ogunbanwo (2010) cited in Nwokocha and Amadike(2005),academic performance of students is a yardstick for testing the educational quality of a nation. Hence, it is required to maintain a high performance in both the internal and external examinations. Ada, Ojelabi and Adeyenin(2009) defined performance of students as an outcome of their academic task which could either be poorly or successfully stated.

The change from the 7-5-2-4 system to the 6-3-3-4 system of education that was introduced in 1995 by the National Provisional Ruling Council(NPRC) led by CaptainStrasserfocused mainly on the cognitive domain of the learners. The 6-3-3-4 system was also changed to the 6-3-4-4 system in2008 after the findings of the Professor GbamanjaCommission that was established by then president, Ernest Bai Koroma. The commission was charged with the responsibility to look into the factors responsible for the abysmal performance of pupils in the 2008 BECE and WASSCE.
Whenever BECE and WASSCE results are published by WAEC in the country, there is always public concern of the performanceoutcome of the pupils in these exams.Stake holders are always eager to know the general performances of the pupils. WAEC's chief examiners always give report on the status of the general performances of pupils in each of the subjects offered by the candidates.According to reports, there had been unsatisfactory performance of pupils in both mathematics and integrated science,this is as a result to the way the questions are answered. Most of thesepupils find it very difficult to answer to application questions,which is the third level of the cognitive domain.Questions usually asked on the lowest level (Recall) are very well answered by the pupils though some may have spelling mistakes. (Chief Examiner, 2005).It is based on this background; the researcher seeks to assess candidates' educational performance in Integrated Science at BECE between 2005 and 2007in Sierra Leone.

1.3 Objectives of the Study

The purpose of the study wasto assess candidates' educational performance in integrated science atBECE between 2005 and 2007in Sierra Leoneand implication for stakeholders, with the following specific objectives:

- To determine the total number of candidates that scored between grades 1-6 at BECE in integrated science between 2005 and 2007 in the selected schools with the following sub- objectives.
- To determine the number of candidates that scored grades 1-6 in integrated science at BECE in 2005 in the Northern, Southern, Eastern Regions and Western Area of Sierra Leone
- To determine the number of candidates that scored grades 1-6 in integrated science at BECE in 2006 in the Northern, Southern, Eastern Regions and Western Area of Sierra Leone
- To determine the number of candidates that scored grades 1-6 in integrated science at BECE in 2007 in the Northern, Southern, Eastern Regions and Western Area of Sierra Leone
- To suggest ways on how performance in integrated science could be improved

2. Methodology

2.1. Research Design

The study adopted descriptive survey research design.

2.2. Population and Sample

2.2.1. Population

The study is delimited to performance of candidates in integrated science atBECE in junior secondary schools between the periods 2005 and 2007 in Sierra Leone**.**The population of the study,comprised of 200 junior secondary schools that presented candidates for BECE between 2005 and 2007, all JSS3 pupils that have been in the schools for at least two years and sat to BECE between the periods 2005 and2007, integrated science teachers and integrated science Heads ofDepartment.

2.2.2. Sample

Out of the population, a sample size of 100 junior secondary schools was randomly selected, by proportionate stratified random sampling technique. These schools comprised of purely boys, purely girls and mixed sex schools. The sample size was determinedthrough the following calculations: The total number of schools per region was expressed as a fraction upon the total number of schools and expressed as percentage to determine the number of schools in each region.

Total number of schools = 200
No. of schools in the Northern Region = 60
No. of schools in the Southern Region = 50
No. of schools in the Eastern Region = 54
No. of schools in the Western Area = 36

2.2.3. Sample Size Calculation for Each Region

Northern Region = 60 x 100 = 30%of the 100 schools to be selected
200 schools
30 x 100 schools = 30 JSS
100

Sample size for Northern Region
= 30 J.S.S.

A simple random sampling method was then adopted to select the thirty Junior Secondary Schools out of the sixty (60) Junior Secondary Schools. The same method was applied to all the other regions and districts to obtain the sample size.

Sample size for Eastern Region = 54 x 100 = 27%
200 Schools
27 x 100schools = 27 J.S.S.
100

Sample size for Southern Region = 50 x 100 = 25%
200schools
25 x 100 schools= 25 J.S.S.
100

Sample size for Western Area = 36x 100 = 18%
200schools
18 x 100schools =18 JSS
100

The same approach was adopted to determine the sample size of the schools in each district

Region	District	Population of School	Sample Size
Northern	Bombali	16	08
	Kambia	12	06
	Koinadugu	04	02
	Port Loko	14	07
	Tonkolili	14	07
	Total	60	30
Southern	Bo	26	13
	Bonthe	04	02
	Moyamba	14	07
	Pujehun	06	03
	Total	50	25
Eastern	Kailahun	18	09
	Kenema	20	10
	Kono	16	08
	Total	54	27
Western Area	Western Urban	24	12
	Western Rural	12	06
	Total	36	18

Table 1: Summary of Population of Schools and Sample Size Determined by Region and District

The Sampling criteria of the one hundred Junior Secondary Schools selected for the study included:

- Geographical location –rural or urban setting
- Enrolment size-below or above Government ceiling
- Gender – purely boys, purely girls, mixed sex schools
- Governance/Funding:-that is
  - Government schools
  - Community managed schools
  - Mission schools

2.3. Instrumentation

The main research instrument used for the collection of data wasthroughadoption of the Basic Education Certificate Examination results between 2005 and 2007.

2.4. Data Collection Procedure

The researcher visited the National Headquarters of WAEC in Freetown, specifically the research department and was exposed to BECE results of the schools forthe periods under study. Grades scored by candidates in integrated science atBECE between the periods 2005 and 2007 were obtained. The researcher used these results to determine performances of candidates by region, district andthe trend within the three year period.

2.5. Method of Data Analysis

Data obtained were analyzed using frequency counts and percentages. The results were displayed on bar charts and line graphs to give clear picture of the findings of the study. Information or data collected were first summarized to

come up with raw scores, some of which were converted into percentages through Statistical Package of Social Science (SPSS) Software.

3. Results and Discussions

3.1. Number of Candidates Passed at Grade 1-6 at BECE in Integrated Science between 2005 and 2007

3.1.1. Performance in Integrated Science at BECE in 2005 by District in Selected JSS in the Northern Region

Table 2 shows the performance ofcandidates in integrated science in 2005 BECE by district in the Northern Region. From the table the performance was discouraging with 42.77% passes in Port Loko District schools, 44.78% passes in Kambia District and 46.30% passes in Tonkolili District. Only the selected schools in Bombali and Koinadugu districts performed better with 53.04% passes in Bombali and 52.16% passes in Koinadugu District. Summarily, 4,139 candidates attempted 2005 BECE in the Northern Region with 46.90% passes and 53.12% failures. This implies that the selected schools in the region did not perform well in 2005. See table 2below for more details.

District	No. Sat to Exam	No. Absent	Grade							No. of Passes (1-6)	%	No. of Failures (7)	%
			1	2	3	4	5	6	7				
Port Loko	1356	-	32 (2.36)	23 (1.70)	105 (7.74)	52 (3.83)	88 (6.49)	280 (20.65)	776 (57.23)	580	42.77	776	57.23
Kambia	498	12	07 (1.41)	07 (1.41)	40 (8.03)	20 (4.02)	469 (9.24)	103 (20.68)	275 (55.22)	223	44.78	275	55.22
Bombali	986	11	15 (1.52)	24 (2.43)	108 (10.95	58 (5.88)	79 (8.01)	230 (23.33)	463 (46.94)	523	53.04	463	46.94
Tonkolili	1067	07	19 (1.78)	18 (1.69)	73 (6.84)	64 (6.00)	94 (8.81)	224 (21.00)	573 (53.70)	494	46.30	573	53.70
Koinadugu	232	00	07 (3.02)	04 (1.72)	19 (8.19)	12 (5.17)	27 (11.64)	62 (26.72)	111 (47.84)	121	52.16	111	47.84
Total	4139	30	80 (1.93)	76 (1.84)	345 (8.34)	206 (4.98)	334 (8.07)	899 (21.72)	2198 (53.10)	1941	46.90	2198	53.10

Table 2: Performances in Integrated Science at BECE in 2005 by District in Selected JSS in the Northern Region of Sierra Leone
** Figures in Parentheses are Percentage*

3.1.2. Performancein Integrated Science at the 2005 BECE by District in Selected JSS in the Southern Region

Figure 1 shows the performance of candidates in the districts of the Southern Region in 2005 BECE in Integrated Science. From the table, performance of these candidates was unsatisfactory compared to the North. A total of 3,574 candidates attempted the exam, 46.64% passed and 53.36% failed. In terms of performance by district, only schools in Moyamba and Pujehun had average performance. In Pujehun, 200 candidates attempted the exam, with59.00% passes and 41.00% failures. In Moyamba District, 533 candidates attempted, with 56.66% passes and 43.34% failures. This implies that the general performance in Integrated Science BECE in 2005 was unsatisfactory.

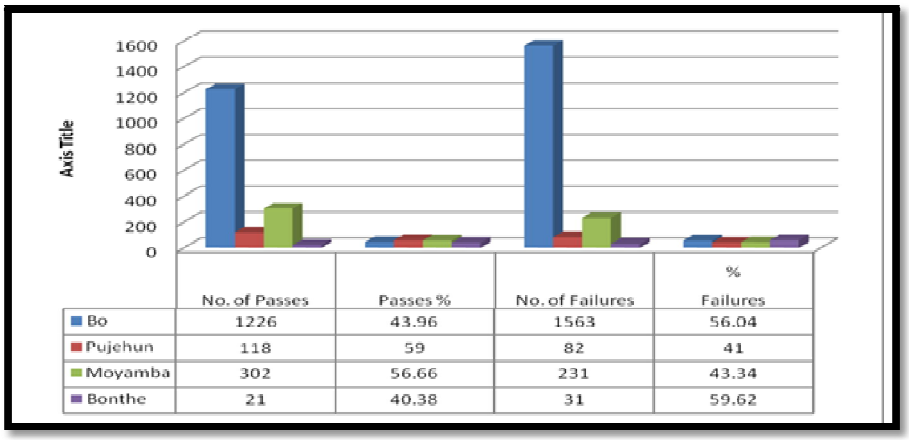

Figure 1: Bar chart showing performance in Integrated Science in 2005 Bece by District in the Southern Region

Figure2 shows the performance of candidates in Integrated Science BECE in 2005. From the table, the performance of the candidates in the selected schools by district was good. Kailahun District had the highest percentage

(66.12%) passes followed by schools in Kono District (54.36%). Candidates in Kenema District performed on average, with (52.05%) passes though they were least compared to the schools in Kailahun and Kono. This implies that performance in the Eastern Region in Integrated Science was very good when compared to the Northern Region.

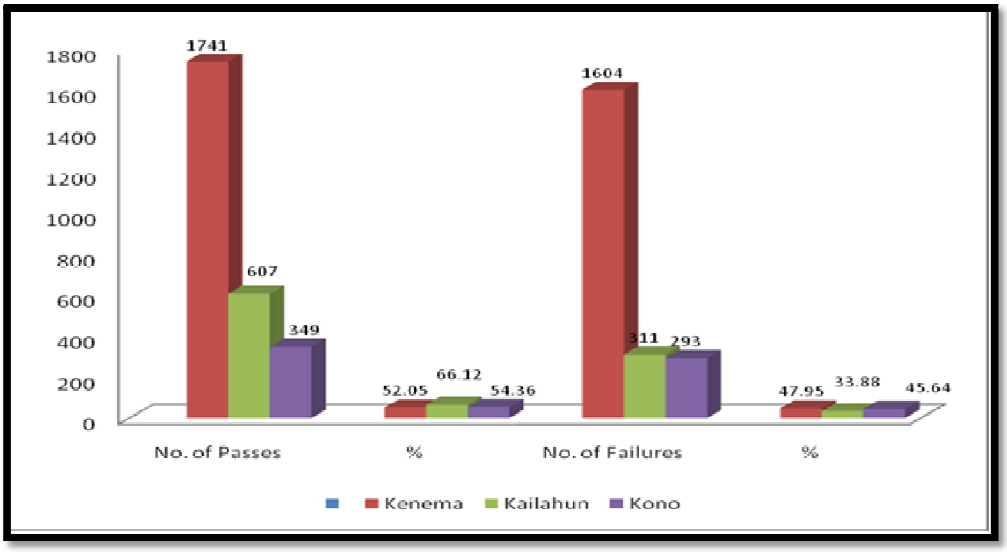

Figure 2: Bar Chart Showing Performances in Integrated Science at the BECE 2005 by District in Selected JSS in the Eastern Region of Sierra Leone

3.1.3. Performance in Integrated Science at the BECE 2005 by District in Selected JSS in Selected JSS in the Western Area of Sierra Leone

Figure 3 reveals candidates' performance in BECE Integrated Science 2005 in the Western Area. From the table, it indicates that the Western Urban performed better than the Western Rural with 6,662 candidates that entered for the exam, 55.12% passed and 44.88% failed. The performance in the Western Rural District was very poor with 34.29% passes. The general performance in the Western Area according to the figure was on average with 53.06% passes.

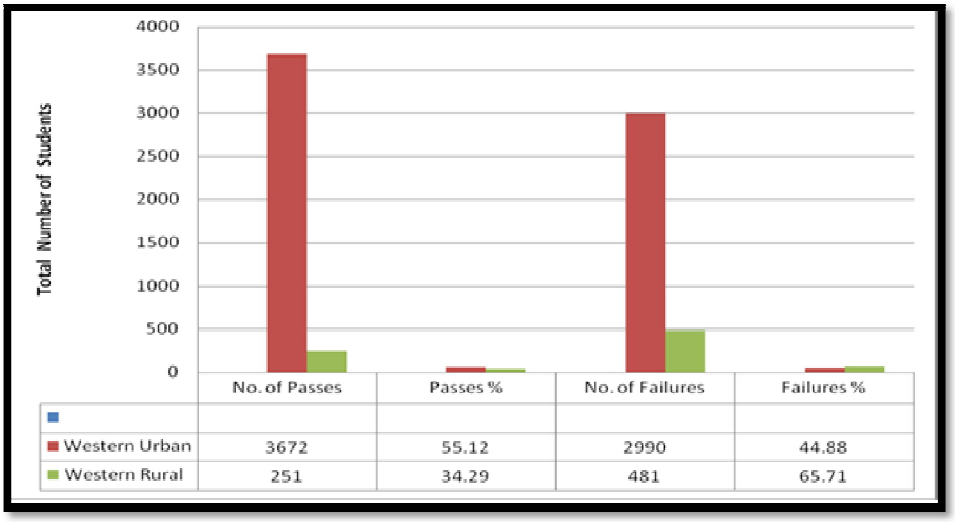

Figure 3: Bar Chart Showing Performances in Integrated Science in BECE 2005 by District in the Western Area

3.1.4. Performances of Candidates in 2006 BECE in Integrated Science by District in Selected JSS in the Northern Region

Figure 4 indicates performance of candidates in 2006 BECE in integrated science by district in the Northern Region. From the table, schools in Port Loko and Kambia Districts performed on average.In Port Loko District, (54.16%) passed and (45.84%) failed. In Kambia District, (50.14%) passed and (49.86%) failed. The other selected schools in the Tonkolili, Bombali and Koinadugu did not get average performance of 50%. In summary, schools in the Northern Region did not perform well, with 49.27% passes and 50.73% failures.

This implies that the administrators, heads of departments and teachers did not work in accordance with their academic task.

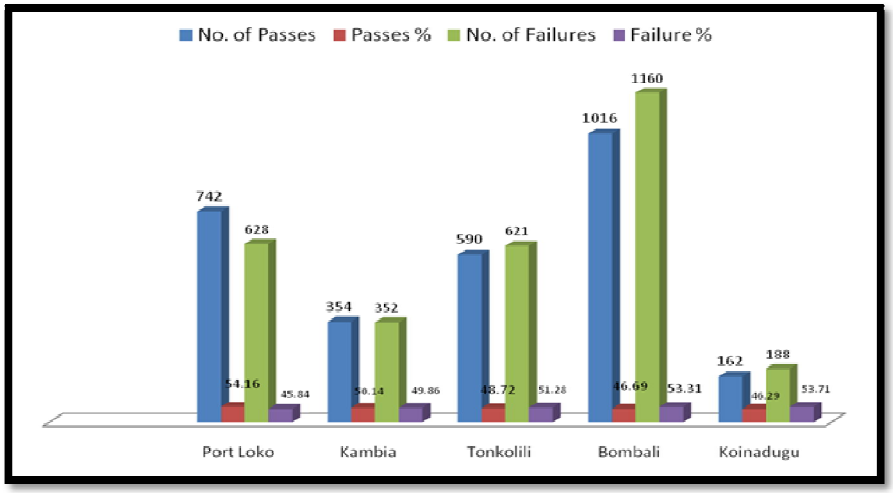

Figure 4: Bar Chart Showing Performances in Integrated Science at the BECE 2006 by District in Selected JSS in the Northern Region of Sierra Leone

3.1.5.Performances of Candidates in 2006 BECE in Integrated Science by District in Selected JSS in the Southern Region

Figure 5 reveals performance of candidates in integrated science at the BECE 2006, in Southern Region, the figure shows that performance of these schools of the districts was not encouraging though the schools in Moyamba District did very well as compared to the other districts with 60.21% passes. The general performance of all the schools in the Southern Region was below average with 46.84% passes and 53.16% failures. This implies that the results were unsatisfactory.

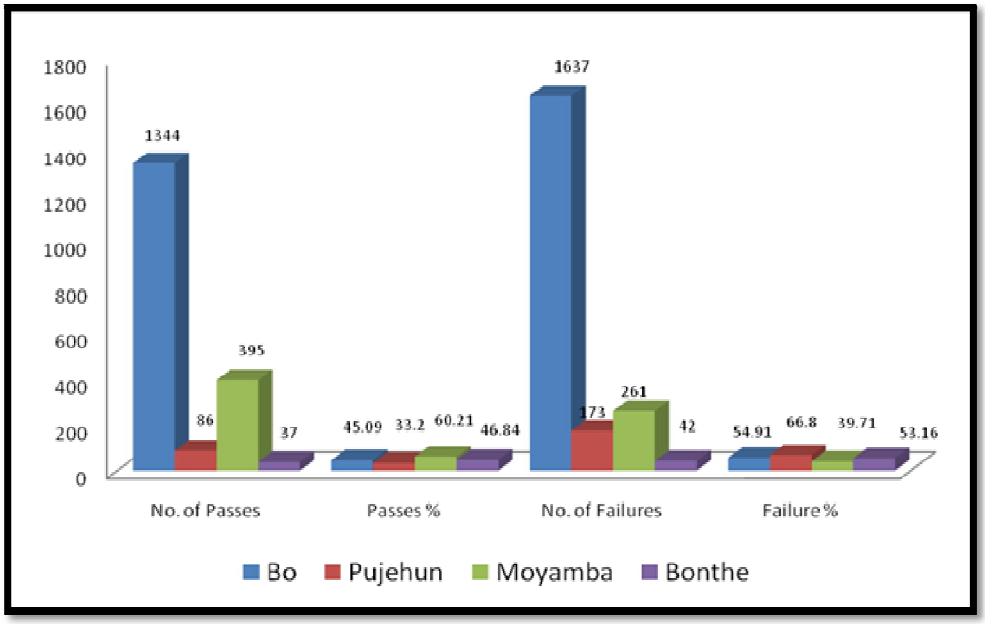

Figure 5: Bar Chart Showing Performances in Integrated Science at the BECE 2006 by District in Selected JSS in the Southern Region of Sierra Leone

Figure 6 shows performance of candidates in the East Region in 2006. From the figure, performance of candidates in Kailahun and Kono District were very good as they had 64.43% and 62.24% passes respectively. In terms of performance by region, 52.81% passed and 47.19% failed. This implies that much effort was made in this year's exam compared to the previous year.

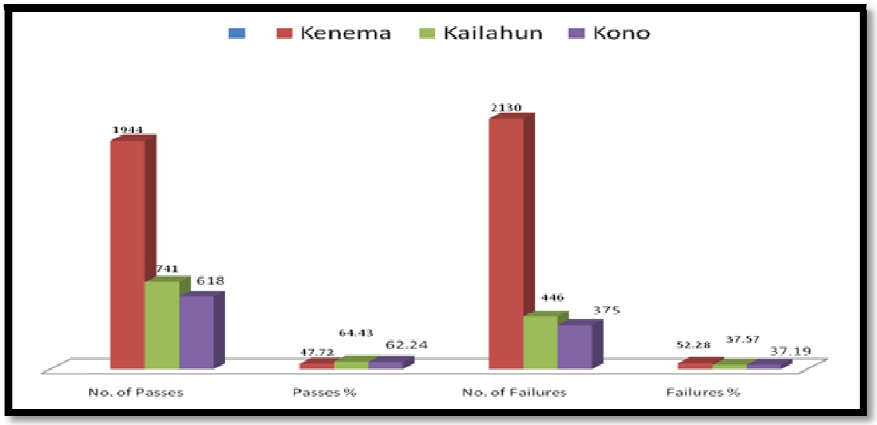

Figure 6: Bar Chart Showing Performances in Integrated Science at the BECE 2006 by District in Selected JSS in the Eastern Region of Sierra Leone

3.1.6. Performances of Candidates in 2006 BECE by District in Selected JSS in the Western Area

As seen in Figure 7, performance of candidates in integrated science in 2006 by district in the Western Area, was better in the Western Urban schools, with 59.97% passes compared to performance in Western Rural District with 41.36% passes. The general performance in Western Area was satisfactory with 7,181 candidates that attempted the exam 57.92% passed and 42.08% failed.

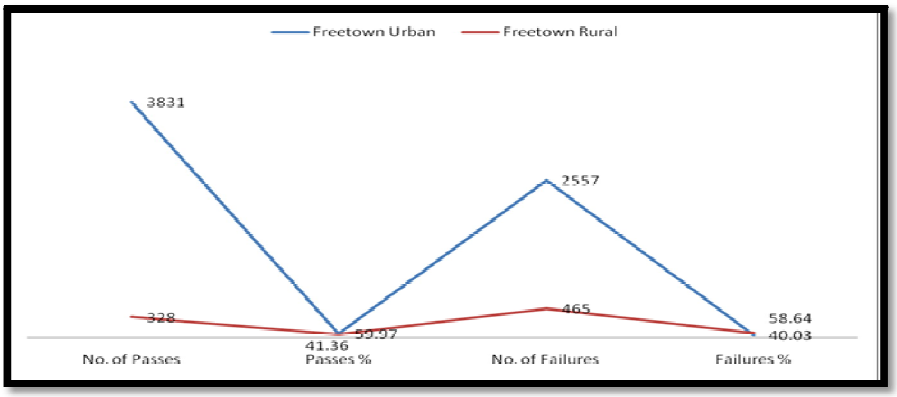

Figure 7: Graph Showing Performance of Candidates in 2006 BECE by District in Selected JSS in the Western Area

3.1.7. Performances of Candidates in 2007 BECE by District In Selected JSS in the Northern Region

Figure 8indicates performance in the Northern Region. As indicated in the figure, Koinadugu District schools had the best performance, followed by schools in the Tonkolili District. The other schools in the three districts did not perform above 50%. This implies that the general performance of candidates in the selected schools in the Northern Region was unsatisfactory with 43.60% passes and 56.40% failures

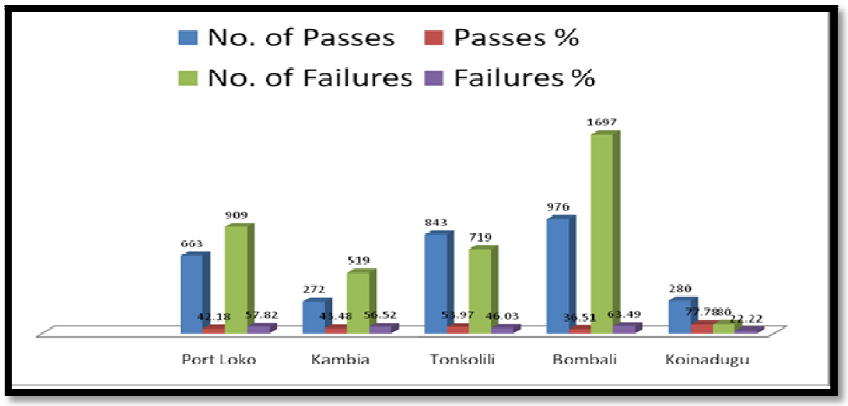

Figure 8: Performances of Candidates in 2007 BECE in Integrated Science by District in Selected JSS in the Northern Region of Sierra Leone

3.1.8. Performances of Candidates in BECE 2007 in Integrated Science in the Selected Junior Secondary Schools by District in the Southern Region Of Sierra Leone

Figure 9 shows performances of candidates in the Southern Region in BECE 2007 in integrated science. Moyamba District performed well with (53.13%) passes and (46.87%) failures. The schools in the other three districts performed below average. Bo had (46.56%) passes and (53.44%) failures while Pujehun District had (49.07%) passes and (50.93%) failures. Bonthe also had (40.74%) passes and (59.26%) failures;

By implication, candidates from the Southern Region in 2007 BECE Integrated Science, was unsatisfactory with (47.62%) passes and (52.38%) failures. The low performance of pupils was observed by Adeyegbe (2002) and attributed it to inadequacy of facilities in schools.

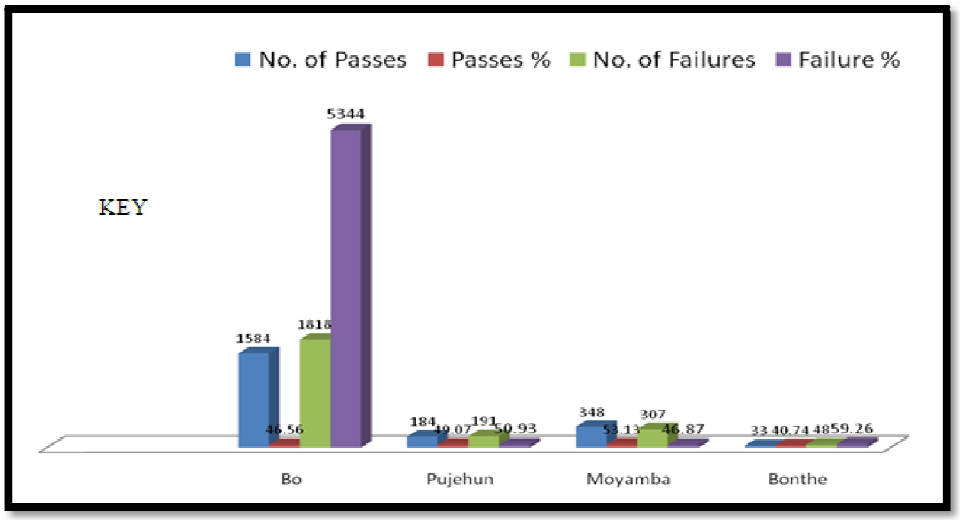

Figure 9: Bar Chart Showing General Performances of Candidates in Bece 2007 In Integrated Science in the Selected Junior Secondary Schools by District in the Southern Region of Sierra Leone

3.1.9. Performances of Candidates in the 2007 BECE in Integrated Science in the Selected Junior Secondary Schools by District in the Eastern Region of Sierra Leone

As shown in Table3 indicates on performances in 2007 BECE in integrated science in the Eastern Region, it could be deduced that only the selected junior secondary schools in the Kono District performed better with 57.48% passes. The other schools in Kenema and Kailahun District performed very low, with 31.97% passes in Kenema and 40.98% passes Kailahun.

This implies that the general performance was discouraging with 38.08% passes and 61.92% failures.

District	No. Sat to Exam	No. Absent	Grade							No. of Passes	%	No. of Failures	%
			1	2	3	4	5	6	7				
Kenema	4414	04	13	32	135	101	231	899	3003	1411	31.97	3003	68.03
Kailahun	1574	26	08	09	93	72	126	337	929	645	40.98	929	59.02
Kono	1157	23	06	15	87	61	134	362	492	665	57.48	492	42.52
Total	7145	53	27	56	315	234	491	1598	4424	2721	38.08	4424	61.92

Table 3: General Performances of Candidates in the 2007 BECE in Integrated Science in the Selected Junior Secondary Schools by District in the Eastern Region of Sierra Leone Source measurement and Evaluation Unit [WAEC]

3.1.10. Performance of Candidates in 2007 BECE in Integrated Science in the Selected JSS by District in the Western Area

Figure 10 shows performances in BECE 2007 in integrated science by district in the Western Area schools. The table reveals that there was better performance in the Western Urban than the Western Rural.

In the Western Urban District, 59.85%, passed while 48.40% passed in the Western Rural District. In the entire Western Area the study reveals that 58.40% passed. This implies that the general performance was good in the year's exam.

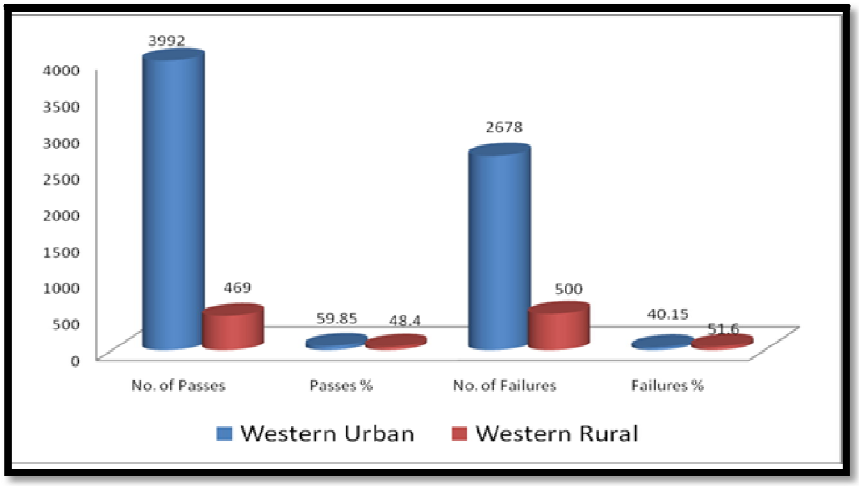

Figure 10: Bar Chart Showing General Performance of Candidates in 2007 BECE in Integrated Science in the Selected JSS by District in the Western Area

4. Conclusion

Based on the findings, it was concluded that performance of candidates in integrated science at BECE between the periods 2005 and 2007 was discouraging. Schools in the Western Area maintained their average performance throughout the three-year period, followed by the schools in the Southern Region with only average performance in 2006 BECE.

5. Implications for Stakeholders

From the findings of the study, it implies for stakeholders like the Ministry of Education officials, curriculum planners, policy makers,the directorate of education in each district, supervisors of schools and principals to be very vigilant and put hands on deck in identifying schools that are underperforming at the BECE.

Participation of teachers and learners in the curriculum design would help improve on performance of pupils. This would also serve as a foundation for teacher quality especially principle involving heads of department in teacher recruitment process. The process would allow trained and qualified teachers in schools.

Annual performance appraisal of teachers should be part of the monitoring strategy that would increase performance and effective monitoring of school attendance of pupils. This mechanism will make teachers and pupils to be regular in schools and more committed thereby ensuring efficiency.

School Boards and Parent Teachers Association also serve as monitoring groups in the schools that regularly discuss issues relating to the educational performance of pupils at their various meetings. This would serve as bedrock to see that possible solutions to the challenges of low performanceare suggested for positive feedback on how performance in integrated science in public examinations would be improved.

6. Recommendations

Based on the findings, the following were recommended for improving on performance in integrated science at BECE

- government should regularly monitor and supervise the teaching and learning process of all junior secondary schools in all the regions and districts of the country.
- The principals should also adopt evaluation strategy by preparing an annual performance appraisal forms for every teacher in the schools and also take record of class attendance of pupils in order to evaluate the teaching/learning process of integrated science in schools.
- government should supply schools with laboratory equipment
- government to provide adequate and up to date teaching and learning materials to the schools.
- School authorities should ensure that they employ more graduates to teach in the BECE classes
- provision of incentive/encouragement for teachers by paying encouraging salaries and remote science allowances
- government to give scholarships to teachers opting for science in the tertiary institutions
- government to construct more schools in each of the districts to reduce congestion of classes.
- the Sierra Leone Association of Mathematics and Science Teachers(SLAMAST) to be organizing workshops, seminars and in-service training for science teachers.
- students to be exposed to more science practical
- the WAEC Integrated Science BECE Syllabus to be strictly adhered to by the teachers
- the curriculum planners to revisit the time scheduled for teaching Integrated Science on the teaching time table
- reduction of class size for effective teaching

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