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The Status of the Characteristics of Junior Secondary Schools, for Teaching/Learning Integrated Science in Sierra Leone and Related Implications

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Abstract:

The study examined the status of the characteristics of Junior Secondary Schools for teaching/learning integrated science in Sierra Leone and related implications. A descriptive research design of a survey type was used for the study. The target population for the study included all junior secondary school pupils offering integrated science in the selected junior secondary schools, Integrated Science teachers and Integrated Science Heads of Department of JSS in Sierra Leone. A sample size of 1,300 respondents was selected for the study. This comprised of 1000 students, 200 integrated science teachers and 100 integrated science HODs from the selected schools. The schools were selected using stratified random sampling technique while the participants were selected using purposive sampling technique. Questionnaire titled "Self-Administered Integrated Science Questionnaires (SAISQ)" was used to sought information from the participants on their perceptions on the status of the characteristic features of JSS for the teaching and learning of Integrated Science. The data collected were summarized into raw scores and tabulated into frequency counts, and later converted into percentages. They were analysed using the Statistical Package of Social Science (SPSS) software.

The study revealed that in Sierra Leone, mixed sex schools predominate in all the districts and regions of the survey. The Northern Region has the highest followed by the Eastern Region and the Western Area has the least. The study further showed that three of the districts; Kambia, Koinadugu and Bonthe lack purely boys schools.

In terms of shift system, there are more Normal Schools in the Eastern Region, followed by the Southern and the Northern Region respectively. In the Western Area there are more Afternoon schools as compared to the other regions, with the highest percentage in Western Urban District of Freetown.

In the Northern Region, most of the schools are owned by missions, followed by private individuals with few owned by the state Government. There are no privately owned schools in Koinadugu and Tonkolili District, and no Government Schools in Kambia, Koinadugu and Port Loko District as the study reveals. There are privately owned schools in the entire districts of the South, no Government owned schools in Bonthe and Pujehun. In the Western Area, the study reveals that most of the schools are owned by missions. It was only the Rural District that does not have Government owned Schools.

On the basis of the location or setting of the schools, the findings shows that majority of these schools are located in the Urban Setting with few located in the Rural Areas. Of these locations, the Southern Region has the highest, followed by the Western Area and Eastern Region respectively. The North had the least percentage

Keywords: *Purely boys, purely girls mixed sex, afternoon shift, morning shift, school, private, government, mission, characteristics, teaching, learning*

1. Introduction

1.1. Background to the Study

The educational system of Sierra Leone expresses the need to include educational planners, curriculum researchers, developers, teacher trainers, inspectors, subject specialists, and computer specialists in a comprehensive policy for professional development. Training of these personnel can be internal or external, in some cases distance learning approach could be utilized and the coordination of educational services would also be improved.

The Government of Sierra Leone through the then Ministry of Education Science and Technology restructured and decentralized Education in all the districts especially district headquarter towns, to facilitate efficiency; and to concentrate on policy development and monitoring policy implementation through the officials of the Directorate of Education and the Board of Governors of the various schools. This was done purposely so that teachers would effectively deliver their teaching subjects

in their various schools as they are supervised by their respective departmental heads and officials of the directorate of MEST in the different districts.

The contents of the Junior Secondary School Curriculum have been designed with a deliberate attempt to avoid both irrelevant and purely academic focus. Subjects offered at this level are classified as being either "Core" or "Elective". The division is to distinguish between those subjects which are regarded as the foundation stones of a literate and numerate individual in present day Sierra Leone (core subjects), and those subjects (electives) which build on this foundation. Both core subjects and electives are essential for achieving the desired educational goals

There are nine core subjects students must study at the junior secondary level which include: Agriculture, French, Integrated Science, Language Arts, Mathematics, Physical and Health Education, Religious and Moral Education, Social Studies and Sierra Leonean Languages (one either from Krio, Limba, Mende, or Temne) and the electives that are sub-divided into two groups, namely: the pre-vocational and non-vocational. The pre-vocational electives include the following subjects: Introductory Technology; Electronics; Local Craft; Home Economics and Business Studies. The non-vocational electives include; Arabic and Creative Arts. (GOSL, 1994)

In each of the three years of schooling as well as the nine core subjects, each pupil must study three electives, two of which must be chosen from the pre-vocational group. (GOSL, 1994).

From the contents of the Junior Secondary School Curriculum, Integrated Science as a core subject was purposely introduced with the hope that it would be taught as a single subject of integration. That is, when the subject is taught as a science course, it is devised and presented in such a way that students gain the concept of the fundamental unity of science, and does eliminate the repetition of subject matter from the various specialized basic science subjects.

The principles of integration are intended to produce a course, which is relevant to students' needs and experiences, lays adequate foundation for subsequent specialist study, and also adds cultural dimension to science education. Integrated Science if presented this way would be a good move to achieve scientific literacy, understand the processes of science, increasing interest in science, meeting the needs of the learners and showing the humanistic character of the discipline where science is married to society.

The Government of Sierra Leone through the Ministry of Education Science and Technology approved higher institutions with Polytechnic status, so that teachers who want to qualify in Integrated Science can enter these institutions to pursue Integrated Science as a course of study rather than qualifying as a Physics, Chemistry or Biology teacher. This means that on completion of the course of study, they would be employed in the junior secondary schools later to teach Integrated Science.

According to (Wurie, 2002), in his report in addressing the Conference of Principals in Freetown, he requested the need for the training of teachers whose specialty is Integrated Science, and as a matter of urgency, there is need for the training of these Integrated Science teachers because it is expected that a teacher who specializes in a particular subject area or discipline, he/she would have been imbued with the philosophy and objectives of the course and would have been introduced to the new strategies of teaching the subject especially the modern techniques, and assessment nature of the subject. (Wurie, 2002).

Integrated Science as a subject was first implemented in Sierra Leone in 1976 after the establishment of Science Curriculum Development Centre (SCDC) at the then Njala University College. This centre helped Science Curriculum changes in the country. This led to the birth of the Core Course Integrated Science (CCIS) which is the Science Curriculum of the former system of education in Sierra Leone, that is, (7-5-2-4) system, where students were taught science in their first three years in the secondary schools.

The rationale for its implementation was to bring about a mode of teaching science that reflects child centered activities rather than teacher centered. It was also aimed at correcting the modes of behaviour of the students both in their approach to problems in their science studies at school, and in the outside world.

By the successful completion of the junior secondary school, it is assumed that the junior secondary school students would have acquired the science process skills and methods as stated in the curriculum enabling them with pre-requisite knowledge to pursue the pure science subjects like physics, chemistry biology, etc at the senior secondary school having pass the BECE.

1.1.1 The Characteristic Features of Schools in Sierra Leone

The characteristic features of schools in Sierra Leone are classified either as school type, shift operation, school governance and school location.

1.1.2. School Types in Sierra Leone

"School Type" refers to gender-related composition of learners enrolled in the schools. That is whether it is a purely boys' school, purely girls' or mixed sex or co-educational school.

1.1.3. The Shift System in Sierra Leone

"Shift" operation refers to a system that concerns the period within which schools are in session (that is morning and afternoon). The two shift system was introduced as a temporary measure to make provision for the increasing number of

secondary school pupils. Rapid rural-urban migration had created the need for more school places. This need was addressed by the two shift system and its accompanying dual administration occasioning duplication of positions.

The shift system came into existence after the eleven years of civil war in Sierra Leone when the 6-3-3-4 system was introduced. The main reason for the implementation of the shift system was due to the following major factors:

- Overcrowding or congestion of pupils in classrooms due to the higher rate of enrolment in schools because of the free basic education that was introduced in Sierra Leone.
- The rapid rural-urban migration
- The inability of the Government through the Ministry of Education Science and Technology to put up more school buildings and other teaching and learning resources throughout the country as a result of the poor economic status of the country.
- Lack of trained and qualified teachers in most of the schools throughout the country.
- To enable school pupils to perform productive work during the day because they attended school only in the morning or afternoon, thus reducing the opportunity cost of schooling.

According to Linden, (2001) the shift system refers to a set or category of pupils who attends school in the morning and the second category attends the same school in the afternoon. Each category of pupils uses the same classroom, equipment and facilities and often the same teachers.

Bray (2008) opined that in developing countries, shift school system especially the two shifts were borne of the necessity to increase the number of school places and thereby fulfill the basic educational needs of more children. Two shift systems have been on an increase especially in developing countries that are taking the Basic Education Certificate Examination like Sierra Leone, Ghana, Gambia and Nigeria.

In Sierra Leone, the shift school system has helped to accommodate the increase in enrollment of pupils in schools, in order to achieve the Universal access to basic education which emphasizes that "Every person – child, youth and adult – shall be able to benefit from educational opportunities designed to meet their basic learning needs". (Article 1 of the Jomtien Declaration).

This system sought to widen access to basic education for all – children, youth and adults. This was in conformity with both the provisions of the World Declaration on Education for All, and the Millennium Development Goals (MDGs). It has also led to economic benefit.

Studies have also revealed that the shift school system has several problems such that the different categories of students in the morning and afternoon sessions using the same facilities under different leadership may lead to damage to the facilities like tables, teaching and learning materials, which affect the learning process of the pupils thereby contributing to a lower quality of education (Bray, 2008).

It has also reduced the teaching time, increased problem of indiscipline in schools, imposed pressure on school resources including teachers many of whom teach in both shifts, and have largely contributed to poor performance.

Shift school according to Childress (2004) is said to have a negative impact on education quality, hours of schooling, management structure and handling of many streams.

The time scheduled for the shift system varies from one country to another. In Sierra Leone, the shift system comprises of the morning session and the afternoon session. The morning session is designated for the Junior Secondary School, which starts devotion at 7:30 am. and classes start at 8:00 am prompt and ends at 12:30 pm. The school is governed by the staff of the junior secondary school with the junior secondary school principal as the administrative head. The afternoon session is designated for the Senior Secondary School starts devotion at 12:30 pm until 1:00 pm when classes start and ends at 6:00 pm. The afternoon session also has its staff also headed by the principal of SSS.

1.1.4. School Governance or Ownership of the Junior Secondary Schools in Sierra Leone

"School Governance" or ownership of the junior secondary schools in Sierra Leone pertains to proprietorship. This could be viewed from two main perspectives; either as public or private.

1.1.4.1. Private School

The school type of school is a privately owned institution as it is controlled by either a Christian agency (Mission) like the Catholic, Methodist, or Pentecostal or by the Muslim agency (Mission) like the Muslim Brotherhood or Islamic mission or Ansarul mission. The private school could also be owned by sole proprietorship; that is such a school is controlled or supported by either the Non Governmental Organizations (NGOs), Social or religious organizations or other private groups or individuals.

1.1.4.2. Public School

A public school on the other hand is any school controlled and/or supported by the state or national government, normally called Government Schools or Municipal Schools or it could be owned by the Community. There have been contentions that school ownership is one factor that affects learning activities which in turn affect performance of students especially in public examinations.

1.1.5. School Location in Sierra Leone

“School Location”, is another characteristic feature of Junior Secondary Schools in Sierra Leone. As a characteristic feature of secondary schools, it has influence on pupil's performance in their academic work.

In the education system of Sierra Leone, schools are established in the urban setting or communities and also in rural setting or communities. The Urban setting schools are referred to as, Urban Junior Secondary Schools, and those established in the rural setting are referred to as Rural Junior Secondary Schools. Pupils who are taught or learn in Urban Junior Secondary Schools are the category of pupils whose parents are found in the urban areas and may be engaged or employed formally or informally. Pupils on the other hand who learn in the Rural Junior Secondary Schools are generally those categories of parents who may not be engaged in formal employment. A good number of these category of parents may be engaged in various activities like petty trading, or small scale economic enterprises.

Parents or guardians of pupils who learn in Rural Junior Secondary Schools are generally less economically strong when compared to parents of pupils, who learn in Urban Junior Secondary Schools.

In terms of academic performance of these pupils in these two setting, research findings of Owoeye and Yara, (2011), show that the achievement of students is influenced by their socio-economic background. These findings are also supported by Brownell, Roos, and Fransoo (2006) who established the fact that, socio-economic status of parents influences the academic competence of students: students from more economically endowed households usually display better academic achievement than their counterparts from poor families.

1.2. Statement of the Problem

After the eleven years of civil war in Sierra Leone (1991-2002), the teaching/ learning of Integrated Science was a serious concern to stakeholders especially the government and the society. Research studies have indicated that there had been a lot of challenges confronted by school administrators, teachers, heads of integrated science department and the JSS pupils because the subject was new and only introduced after the former system of education (7-5-2-4) where the subject was taught as independent subjects as physics, chemistry and biology at then Form 3. All these challenges encountered by these key players in the teaching and learning process were in line to the characteristic features of the schools where integrated science is taught, which had influence or served as the bedrock to the academic performance of pupils in integrated science at the JSS level in Sierra Leone.

As asserted by Goodrum et al. (2001), he compared the teaching/learning of science under two situations, that is the actual situation which describes what is exactly happening in the school and the ideal situation which describes the evidence based expectations under normal situation of the teaching/learning of science at the JSS. These characteristics features of schools have impact on the teaching and learning process. Each aspect if not treated well may negatively influence teaching/learning thereby resulting to low academic performance of pupils in integrated science in the schools. It is against this backdrop the researcher seeks to examine the status of the characteristic features of Junior Secondary Schools, for teaching/learning integrated science in Sierra Leone between and Related Implications.

1.3. Objectives of the Study

The study seeks to:

Examine the status of the characteristic features of the Junior Secondary Schools for Integrated Science teaching/ learning in Sierra Leone, with special reference to:

- The type of schools for the teaching/learning of Integrated Science
- The shift schooling for teaching/ learning of Integrated Science
- The governance of the schools for the teaching/learning of Integrated Science
- the location of the schools for teaching Integrated Science

2. Methodology

2.1. Research Design

The study employed descriptive survey design to study the characteristic features of the selected JSS for integrated science teaching and learning. According to Oso and Onen (2009), descriptive survey design, is the systematic collection of data in standardized form from an identifiable population or representative. Through this method, the study sought to establish how the situation is on the ground as far as the characteristic features of the selected JSS for integrated science teaching and learning is concerned.

Orodho (2009) defined a survey as a method of collecting information either by interviewing or through questionnaire administration to a sample of individuals that from a well defined population. This method helps the researcher to solicit information from findings that could be presented as a representation of the entire population of the study.

. With the survey design, the researcher attempts to generalize from the sample observations to the entire population from which the sample was drawn, this method adopted was adopted by the researcher because it was appropriate as it involved an extensive collection of data for the purpose that described and interpreted an existing situation under study.

2.2. Target Population

Mugenda and Mugenda (2012) defined target population as the particular entity of people, objects or units to which a researcher can reasonably generalize his or her research findings.

The target population for the study included all junior secondary school pupils offering integrated science in the selected junior secondary schools, Integrated Science teachers and Integrated Science Heads of Department in the different JSS.

2.2.1. Sample and Sampling Technique

The researcher selected the following participants: Integrated Science HODs, Integrated Science Teachers and JSS pupils, for the study based on a simple random selection process without any form of biasness. Heads of Integrated Science Department were however selected using purposive sampling technique because every Integrated Science HOD had to be part of the study. In all, sample of 1,300 respondents were selected for the study. This comprised of 1000 students, 200 integrated science teachers and 100 integrated science HODs from the selected schools.

2.3. Research Instrument

The researcher employed self-administered Integrated Science Questionnaires (SAISQ). These were used to obtain information from the integrated science HODs, Integrated Science Teachers and the JSS pupils of the selected schools. The researcher therefore constructed the questionnaires for the different respondents; the Integrated Science Teachers' questionnaire, the Integrated Science HODs' questionnaire and also questionnaire for the pupils to sought information on their perceptions on the status of the characteristic features of JSS for the teaching and learning of Integrated Science. A document analysis guide was also used to get information relating to the main characteristic features of the schools under study. This enabled the researcher to trace the status of the schools involved in the study.

2.4. Validity and Reliability of Instruments

Draft copies of the instruments were given to a team of Science Education experts of the Njala University. They were requested to evaluate the items based on clarity and appropriateness of the language used and adequacy of the items in addressing the research questions of the study.

The questionnaires developed were field-tested and the result was used to determine the reliability of the instrument, and it produced a Cronbach alpha coefficient value of 0.74. This reliability of the questionnaires was obtained before they were administered to the respondents.

2.5. Method of Data Collection

After ensuring the validity and reliability of the research instrument, the primary data for this study was thus collected. The primary data was obtained using structured questionnaires. The questionnaires were administered to 100 HODs, 200 Integrated Science teachers and 1000 JSS3 pupils sampled for the study. The questionnaires were given to the HODs through the principals of the selected schools and collected back personally. The teachers' questionnaires were given through the HODs. The students' questionnaires were given to them through their Integrated Science teachers, who also collected the completed copies from them. Badly completed ones were discarded while the good ones were used for analysis. A total of 1,300 questionnaires were administered and only 1,209 were properly filled and returned, thus making a response rate of (93.0%).

2.6. Data Analysis

Data collected for the study was first coded and analyzed according to the objectives or research questions identified for the study. The analysis was done using the Statistical Package of Social Science (SPSS) software. The results were graphically displayed on bar charts and pie charts to give clear picture of the findings of the study. The information or data collected were first summarized to come up with raw scores and tabulated into frequency counts, some of which were converted into percentages.

3. Results and Discussions

3.1. The Characteristic (Features) of the Selected Junior Secondary Schools

The study sought to discuss the characteristic features of the selected Junior Secondary Schools in Sierra Leone. This is discussed under the following classifications: the school type, the shift operation, school governance or ownership and the school location.

"School Type" refers to gender-related composition of learners enrolled in the selected junior secondary schools;

"Shift operation" concerns the period within which schools are in session for the teaching and learning of integrated science either as morning shift (A.M shift) or Afternoon shift (P.M.shift).

"School Governance" pertains to proprietorship or school ownership i.e. whether it is privately owned by an agency or mission (Christian or Muslim agencies) or by sole proprietorship i.e. individually owned or owned by an organization like

NGO or social organization or the school is publicly owned by either Government as Government school or owned by community commonly called community school.

“School Location” is where the school is situated or the site or environment of the school, where teaching and learning of integrated science takes place. That is whether it is situated in a rural community or urban community environments.

3.2. Results and Discussions on School Types

As indicated in Table 1, on results obtained on school types, it is recorded from the Northern Region that, 10.0%, 13.33% and 76.67% of the schools in the sample were purely boys, purely girls and mixed sex types of schools respectively. The purely boys' schools were found in Bombali, Port Loko and Tonkolili Districts with none in Koinadugu and Kambia Districts. A similar distribution of the purely girls' schools, compared to the purely boys type of school is found in the same districts with addition of one in the Kambia District. Refer to Table 1 for further details.

By far the most popular type of school, mixed sex in the Northern Region was found in all the five (5) districts included in the study totaling 23, relative to only three and four of the purely boys and purely girls' types respectively. Koinadugu District has none of the boys or girls types of school. It also reads that only two of the mixed sex schools are in the sample.

In the Southern Region, 20.0 %, 24% and 56% of the sampled schools were purely boys purely girls and mixed sex schools respectively. The purely boys schools were found in Bo, Moyamba and Pujehun. Bo District had the highest number of purely boys' schools. For the purely girls' schools, Bo and Moyamba had the same number of purely girls schools, also Bonthe and Pujehun.

There was a high percentage, 56% of mixed sex schools in the Southern Region followed by purely girls' schools 24%. Bonthe District hadn't purely boys' schools.

In the Eastern Region, all the three districts; Kailahun, Kenema and Kono had purely boys' and purely girls' schools. Kailahun and Kenema had equal numbers of both purely boys' and purely girls' schools. Kono had the highest number compared to Kailahun and Kenema. It was observed that 70.38 % of the sampled schools fell under the mixed sex school category.

In the Western Area, there was no purely boys' and girls' school in the Rural District of Freetown. The Urban District of the Western Area of Freetown had equal numbers of boys' and girls' schools (four). The purely boys and girls form 22.22 % each and 55.56 % were mixed sex schools.

The study showed that the majority of the schools of the survey were mixed sex schools, with the Northern Region 76.67%, the highest and the Western Area 55.56% the lowest. This implies that in Sierra Leone, mixed sex schools predominate in all the districts and regions. Notable, is that three of the districts; Kambia, Koinadugu and Bonthe lack purely boys schools.

According to Smith (1998), by implication, in attending a mixed sex school, there may be social benefits to be gained especially if the child comes from a family where all the children are of one sex, either all girls or all boys.

Studies have also shown that in a good mixed sex school the pupils treat each other as friends, rather than as members of the opposite sex. There is a lack of gender stereotyping. This practice may lead to a smoother transition from secondary school to university or to the world of work. There may be some academic benefits for a girl or a boy to attend a single-sex school if they are at risk of having their studies disrupted by the presence of the opposite sex in the same school. Some students may be distracted by members of the opposite sex and may form relationships which interfere with their concentration on their studies. In such cases there is a need for counselling to encourage such students to adopt a balanced approach to their academic work and their social life. A single-sex school environment may reduce the risks of distraction in the first place. (Smith,1998).

Region	District	School Type		
		Boys N=16	Girls N=18	Mixed N=66
Northern Region	Bombali	01	01	06
	Kambia	00	01	05
	Koinadugu	00	00	02
	Port Loko	01	01	05
	Tonkolili	01	01	05
	Total	03 (10.00)	04 (13.33)	23 (76.67)
Sourthern Region	Bo	03	02	08
	Bonthe	00	01	01
	Moyamba	01	02	04
	Pujehun	01	01	01
	Total	05 (20.00)	06 (24.00)	14 (56.00)
Eastern Region	Kailahun	01	01	07
	Kenema	01	01	08
	Kono	02	02	04
	Total	04 (14.81)	04 (14.81)	19B (70.38)
Western Area	Western Urban	00	00	04
	Western Rural	04	04	06
	Total	04 (22.22)	04 (22.22)	10 (55.56)

*Table 1: Distribution of the Types of Junior Secondary Schools in Sierra Leone
Figures in Parenthesis Are Percentages*

3.3. The Shift School Operation System

The researcher sought to determine the distribution of schools in terms of shift operation as a characteristic feature of integrated science teaching and learning. This concept is discussed thus:

In terms of shift of the selected schools, in the Northern Region, 13.33% were A.M schools, that is, schools that operate in the morning hours and end up at 1.00 p.m. These schools were found in the Bombali (2) and Tonkolili Districts (2). There was no afternoon shift (p.m.) school in all the districts of the Northern Region. It was observed that 86.67 % of these schools investigated were Normal Schools. That is, schools that operates in the morning starting 8.00 a.m. to 2.00 p.m. This implies that in the Northern Region there was not much competition for infrastructure, since there are no (p.m.) schools to take on dual shift delivery system; this further translate into a rather not highly populated enrolment in the schools.

In the Southern Region, 12 % of the sampled schools were A.M. shift schools; 88% were Normal Schools and no P.M. shift school. The A.M. schools were found in Bo District. Moyamba District had the highest frequency of (7) Normal Schools. In the Eastern Region, 11.11% were A.M. shift schools found mainly in Kenema District; there was no P.M. shift school in the Eastern Region and 88.89 % were Normal Schools. Kailahun had the highest frequency (9) followed by Kono (8).

In the Western Area, 61.11% were P.M. shift schools. The Western Urban District had the highest frequency (10). There was 27.78 % A.M. shift schools and 11.11% Normal Shift Schools. This implies that in the Western Area, all the three types of shift schools do operate. Sierra Leone in particular, there were more Normal Schools in the East 88.89%, followed by the South 88.00% and the North 86.67%. It is also observed that in the Western Area there were more Afternoon schools 61.11% as compared to the other regions.

Bray (2000) is justifying this situation by stressing two points in favor of the double-shift schooling. The first one is the fact that the introduction of double-shifts may permit reduction in class size and therefore allows a more personalized and individualized teaching approach. Secondly, double-shift schools are reasonably larger and therefore find it easier to justify expenditure on sports facilities, libraries and laboratories. Bray (2000, p. 50) attributes the poor performance in double-shift schools rather to socio-cultural factors than to the number of shifts in a school.

By implication, the two shift system was introduced in Sierra Leone as a temporary measure to make provision for the increasing number of secondary school students. Rapid rural-urban migration had created the need for more school places. This need was addressed by introducing the two shift system. The two-shift system has reduced the instructional time, the first periods of both morning and afternoon shifts are lost due to the late arrival of both teachers and pupils. The morning shift is expected to begin at 8.00 a.m. but in reality, it begins in earnest a couple of hours later and end of 12.30 p.m. .to make room

for the p.m. shift pupils at 1, 00 p.m., this has created problems of indiscipline, imposed pressure, overuse and misuse of school resources and the lack of commitment on the part of teachers.

Region	District	Shift Operation System of the Schools		
		AM n=15	PM n=11	Normal n=74
Northern Region	Bombali	02	00	06
	Kambia	00	00	06
	Koinadugu	00	00	02
	Port Loko	00	00	07
	Tonkolili	02	00	05
	Total	04 (13.33)	00 (0.00)	26 (86.67)
Sourthern Region	Bo	03	00	10
	Bonthe	00	00	02
	Moyamba	00	00	07
	Pujehun	00	00	03
	Total	03 (12.00)	00 (0.00)	22 (88.00)
Eastern Region	Kailahun	00	00	09
	Kenema	03	00	07
	Kono	00	00	08
	Total	03 (11.11)	00 (0.00)	24 (88.89)
Western Area	Western Urban	02	01	01
	Western Rural	03	10	01
	Total	05 (27.78)	11 (61.11)	02 (11.11)

Table 2: Distribution of Junior Secondary Schools in Terms of Shift Operation Sierra Leone
Figures in parenthesis are percentages

3.4. School Governance or Ownership

The study sought to establish school Governance or ownership as a characteristic feature of integrated science teaching and learning in the selected schools in Sierra Leone. School owner or governance in Sierra Leone educational system refers to whether the school is publicly owned or privately owned. Public owned schools are either community schools or Government owned schools. The Government owned schools are also referred to as municipal schools.

Private owned schools are schools that are owned by mission schools like the Catholic or Methodist agencies or schools that are owned by Muslim Agency. Private owned schools could also be referred to as Sole proprietorship. That is schools that were established either by Social Organizations or Non Governmental Organizations or private individuals. The results of the findings are discussed below:

As indicated in Table 3, in the Northern Region, 13.33%, 76.67% and 10.00% of the schools selected were governed by Private, Mission and Government respectively. From the total of 30 respondents, 76.67% of these schools were owned by Missions, 13.33% were privately owned and 10.00 were owned by the Government. There were no privately-owned schools in Koinadugu and Tonkolili District, and there were no Government Schools in Kambia, Koinadugu and Port Loko Districts. See Table 2, for more details.

In the Southern Region, there were 16% of privately owned schools, 76 % Mission Schools and 8% were Government owned schools. There were Privately Owned Schools in the entire districts in the South, no Government owned Schools in Bonthe and Pujehun, and majority of the schools of the survey were predominantly owned by Missions 76 %.

In the Western Area, 22.22 % of the sampled schools were privately owned, 66.67 % were Mission Schools. It was only the Rural District that did not have Government owned Schools. Overall, Majority of the schools were owned by Missions with the highest percentage 88.89% in the East, followed by the South 88% and the North 86.67%. The Western Area had the least percentage of Mission Schools. This should not come as surprise if individuals who own schools are determined to employ the best teachers possibly by giving the incentives to motivate their teachers to enjoy their work.

Region	District	School Governance or Ownership		
		Private n=15	Mission n=77	Govt. n=8
Northern Region	Bombali	01	06	01
	Kambia	01	05	00
	Koinadugu	00	02	00
	Port Loko	02	05	00
	Tonkolili	00	05	02
	Total	04 (13.33)	23 (76.67)	03 (10.00)
Sourthern Region	Bo	02	10	01
	Bonthe	00	02	00
	Moyamba	01	05	01
	Pujehun	01	02	00
	Total	04 (16.00)	19 (76.00)	02 (8.00)
Eastern Region	Kailahun	02	07	00
	Kenema	01	08	01
	Kono	00	08	00
	Total	03 (11.11)	23 (85.19)	00 (3.70)
Western Area	Western Urban	02	02	00
	Western Rural	02	10	02
	Total	04 (22.22)	12 (66.67)	02 (11.11)

Table 3: Distribution of Junior Secondary Schools in Terms of School Ownership in Sierra Leone
Figures in Parenthesis Are Percentages

3.5. Location or Setting of Schools

On the basis of the location or setting of schools, in the Northern Region 33.33% were found in the Rural District, and 66.67% were found in the Urban District.

In the Southern Region, there were 16% Rural Schools and 84% Urban Schools. In the Eastern Region there were 7% Rural and 20 % Urban Schools. In the Western Area, 22.22% were Rural Schools and 77.78 % were Urban Schools. The survey according to Table 2 showed that majority of the schools were located in the Urban Setting with 25% of these schools located in the Rural Areas and 75 % in the Urban Areas with the highest percentage in the South 84.00%, followed by the Western Area 77.78% and East 74.07%. The North had the least percentage 66.67%.

Region	District	School Location	
		Rural n=25	Urban n=75
Northern Region	Bombali	05	03
	Kambia	02	04
	Koinadugu	00	02
	Port Loko	02	05
	Tonkolili	01	06
	Total	10 (33.33)	20 (66.67)
Sourthern Region	Bo	02	11
	Bonthe	00	02
	Moyamba	02	05
	Pujehun	00	03
	TOTAL	04 (16.00)	21 (84.00)
Eastern Region	Kailahun	02	07
		03	07
	Kenema	02	06
	Kono	07 (25.93)	20 (74.03)
	Total	04	00

Region	District	School Location	
		Rural n=25	Urban n=75
Western Area	Western Urban	00	14
	Western Rural	04 (22.22)	14 (77.78)
	Total	Rural n=25	Urban n=75

*Table 4: Distribution of Junior Secondary Schools in Terms of School Location Sierra Leone
Figures in Parenthesis Are Percentages*

4. Conclusion

The characteristics features of the Junior Secondary Schools in Sierra Leone for the teaching of Integrated Science has significant related implications on the performance of pupils in the public examinations (BECE). From the findings, the study concluded that in terms of school type, majority of the schools of the survey were mixed sex schools, with the Northern Region being the highest and the Western Area the lowest. This implies that in Sierra Leone, mixed sex schools predominate in all the districts and regions. Notable, is that three of the districts; Kambia, Koinadugu and Bonthe lack purely boys schools.

In terms of Shift of the schools, in the Northern Region, few (13.33%) were A.M schools. These schools were found in the Bombali (2) and Tonkolili Districts (2). There was no afternoon shift (p.m.) school in all the districts of the Northern Region. It was observed that, majority were Normal Schools. In the Southern Region, few (12 %) of the schools were A.M. shift schools, while majority were Normal Schools and no P.M. shift school. These A.M. schools were found in Bo District. Moyamba District had the highest frequency of (7) Normal Schools.

In the Eastern Region, A.M. shift schools were found mainly in Kenema District; there was no P.M. shift school and majority were Normal Schools. Kailahun had the highest frequency (9) followed by Kono (8). In the Western Area, all the three types of shift schools do operate. With majority (61.11%) w P.M. shift schools especially the Western Urban District schools had the highest frequency (10), few (27.78 %) A.M. shift schools least (11.11%) Normal Shift Schools.

For governance, the study revealed that most (85.19%), for the Eastern Region, (76.67%) Northern and Southern Region and 66.67% in the Western Area are governed by the missions or the agencies. There were no privately owned schools in Koinadugu and Tonkolili District, and there were no Government Schools in Kambia, Koinadugu and Port Loko District in the Northern Region as indicated in the table.

There were Privately Owned Schools in the entire districts in the Southern Region, no Government owned Schools in Bonthe and Pujehun,

In the Western Area, majority of the schools were owned by Missions with the highest percentage (88.89%) in the East of Freetown, followed by the South of Freetown (88%) and the North of Freetown (86.67%). The Western Area had the least percentage of Mission Schools.

The survey according to Table 4 showed that majority of the schools were located in the Urban Setting with 25% of these schools located in the Rural Areas and 75 % in the Urban Areas with the highest percentage in the South 84.00%, followed by the Western Area 77.78% and East 74.07%. The North had the least percentage 66.67%

5. Related Implications

In Sierra Leone, mixed sex schools predominate in all the districts and regions this implies that in mixed sex schools the pupils treat each other as friends, rather than as members of the opposite sex. There is a lack of gender stereotyping.

By implication, the two shift system was introduced in Sierra Leone as a temporary measure to make provision for the increasing number of secondary school students. Rapid rural-urban migration had created the need for more school places. This need was addressed by introducing the two-shift system and also assist in the independent administration of each level of schools. This also help in the control of disciplinary challenges and improve performance.

Schools are effectively monitored by the agencies that owned the schools as they are directly involved in the recruitment procedures of the schools.

The socio economic status of parents of pupils attending urban schools is not the same as compared to the parents of pupils attending rural areas. This has high impact in terms of academic performance of these categories of parents in terms of support to these pupils.

6. Recommendations

The following recommendations were made based on the findings:

For the enhancement of Integrated Science teaching and learning, government, school authorities and the curriculum developers must work together and abolish the shift system in the Junior Secondary Schools and only allow schools to operate the Normal School system starting from 8 a.m. to 2 pm.

Government should build more schools in each of the chiefdoms in each district to reduce congestion such schools should include purely boys, purely girls and mixed sex schools.

Government should construct government schools in all the districts in the country, such schools should include either purely boys or purely girls or mixed sex schools.

There is the need for the Sierra Leone government to provide adequate learning materials, laboratory equipment, textbooks for the different types of schools.

Equal opportunities should be given to all types of schools by government in terms of infrastructures and other facilities

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