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Full Length Research

The Relationship Between Students Attitude Towards Science and their Academic Performance in Selected Secondary Schools in Bo City, Southern Sierra Leone

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Science teaching and learning in schools and colleges in Africa has for a long time been patch work that quickly fell apart. Science subjects have always been looked at as mysterious and difficult to learn. The fear of studying science subjects leads to all sorts of attitudes mostly negative attitudes towards the subject and this subsequently affects performance. The main aim of this study is to investigate the relationship between students' attitude towards science and their academic performance in five selected secondary schools in Bo city .The study is a descriptive survey design which showed the relationship between two variables; attitude and performance. The population of the study included; administrators, science teachers and students in the schools under investigation. These include the Bo school, Milton comprehensive secondary school, Christ the king College, Queen of the Rosary secondary school and United Christian Church making a total population of 4,500. The sample size is 185, comprising 10 administrators, 75 science teachers and 100 students. The results indicated that attitude of students towards science and academic performance have significant relationship. The poor performance of some students in science in these schools is not unconnected with certain problems ranging from lack of adequate teaching/learning materials, ill-equipped science laboratories to inadequate trained and unqualified science specialists. Recommendations made included; motivation of science teachers, availability of teaching/learning materials in schools, provision of equipped laboratories, and employment of qualified science teachers.

Keywords: Students Attitude, Performance, science laboratories, science teachers, relationship, teaching/learning materials

INTRODUCTION

Motivating students to study science is one of the challenges facing science education. According to the national commission on mathematics and science teaching/learning in the US department of science education (2000),success in the knowledge based careers depends on how well young people are educated in scientific and technical disciplines. According to the national assessment of educational progress (NAEP),since 1969, there has been a decline in science achievement scores of students over the years, a national study examining trends in undergraduate education has revealed a steady decline in students interest in the science. Since many students are leaving science courses with negative attitudes. Attitude had been a very difficult concept to describe since it cannot be directly observed. This has

led to a variety of definitions. One definition that is commonly used to describe attitude include the three components of Cognition, Affective and Behaviour (kind et.al. 2007). These three components are defined as a knowledge about the idea, beliefs objects (Cognitive), a feeling about the action or objective component (behaviour) (Reid 2006 p.4). This definition is a sensible view of attitude because it has a close link with the cognitive type, For example, we know about science (cognitive) and therefore we have a feeling or opinion about it (affective) that may cause us to take a particular action (behaviour). Grano and Prilin (2006) pointed out that it is important to notice that these evaluative judgements are always towards something often called attitude objects. Attitude can also be explicit and implicit that is consciousness and unconsciousness of our belief and behaviour (Jung 2008 page 687). Academic achievement is the student academic accomplishment which is represented by grade or percentage in our educational system. Student education quality is measured by academic achievement. Academic achievement is the level of academic attainment in school subject which is obtained by students in the examination (Kohli 2009).When children start school, their attitude towards learning is derived primarily from their home environment (Lumsden 1994).However, success or failure in the class room impact on these initial attitudes and is shaped by early school experiences which in turn impact on subsequent class room situations. Several studies have indicated that there is a significant association between students attitude with achievement outcomes. According to martinet et. al. (2012), each successive assessment has shown a strong positive relationship between student attitude towards science and their performance. Ali et.al (2013) conducted a research on students to examine the relationship between student attitudes towards science and performance in science. The study involved 1506 final year students. Their result indicated that attitude towards science had a significantly negative relationship with performance. This study investigated the relationship between students' attitude towards science and their academic performance in selected secondary schools in Bo City, Southern Sierra Leone between the periods March 2020 to October 2020. The schools include; The Bo School, Milton Comprehensive Secondary School(MCSS), Christ The King College(CKC), Queen of the Rosary Secondary School(QRS),and United Christian Church(UCC).

Aim and Objectives

The purpose of this study was to compare the relationship between students' attitude towards science and their academic performance in selected secondary schools in Bo city with the following specific objectives:

i) determine the number of qualified and unqualified teachers teaching science in these selected schools in Bo city.

ii) examine students attitude towards science in the schools under investigation.

iii) assess students academic performance in science subjects in promotional examinations for 2017 academic year.

iv) identify problems associated with science teaching and learning in the schools under investigation.

v) proffer possible solutions to improve science teaching/learning in the schools under investigation.

The study was focussed on attitude and academic performance of students which represent a pioneering attempt to investigate the relationship between these two variables in selected secondary schools in Bo City. In this regard therefore, its findings are to be more useful to the respondents not only in the Schools under investigation but other Schools, Colleges and Universities in the Country. The study would help to improve students' academic performance in their various Schools as well as promote good attitude towards Science that would have influence on the development of not only Science but education in general. The study will be of great help to the Government from a practical point of view, the effect of school science activities on it's people in the selected secondary schools and the country as a whole. It can also help the students to identify the various teaching and learning problems in science.

This study can also help students and other researchers wishing to offer or pursue course in the sciences in schools and colleges as they will be equipped with some materials that cannot easily be found in texts and other books as reference materials for their further research work.

METHODOLOGY

Study Area

The study area of this research is Bo city, Kakua Chiefdom, Southern region of the Republic of Sierra Leone. Bo city is the headquarter town for the chiefdom, district and the Southern region as a whole which also doubles as the second capital city of Sierra Leone. It is a city of two chiefdoms-Tikonko and Kakua. It is located in the central part of the country in which major academic and non-academic institutions are found such as schools, churches, mosques, markets, colleges and the Njala University. The city has a population of about 300,000 people including men, women and children according to the 2015

census result. Agriculture and trade are the dominant economic activities of the population. The decentralization process earned Bo several offices including the immigration office, several Ministries, Parastatals, Non-Governmental Organizations and numerous private commercial enterprises.

Design of the Study

The study design is correlational that seems to examine and compare the relationship between two variables: a) student's attitude towards science and b) their academic performance in science. It is also a mixed design based on qualitative and quantitative approaches to collect primary data from self-completed questionnaires, interviews and focus group discussions. The study makes use of descriptive statistics such as frequencies, charts and percentages to analyse the data and report the findings.

***Population and sample size*.**

The population of the study included students, science teachers and administrators from five selected schools in Bo city. They include; the Bo Government secondary school (BGSS), Milton comprehensive secondary school (MCSS), Christ the King College (CKC), United Christian Church (UCC) and Queen of the Rosary Secondary Schools (QRSS).The total population is estimated as 4,500 students in the selected schools in Bo city. The sample size is 185, comprising 10 administrators, 75 science teachers and 100 students in the schools under investigation.

Sampling procedures

During the selection in process, there was no sex or gender bias. Considering the large size of the population and the difficulties involved in dealing with a large sample size, the researcher used a population random sampling technique in the selection of five secondary schools and the respondents.

Instrumentation

Questionnaires were developed based on the objectives of the study. The questionnaires were used to obtain relevant information on the study .The instruments were designed bearing in mind that they elicit exactly the type and quality of data that were required, that is, the researcher ensured that the questions developed were valid and reliable. The questionnaires were pre-tested in three schools in Kenema city. After pre-testing, the responses to items in the instruments were analysed, found to be similar in interpretation by the subjects who responded to the items, which implies that the instrument was reliable. The questionnaires were self -administered by the researcher.

Data collection and analysis

Questionnaires were used to collect data from the study population sample. The questionnaires were administered to the administrators, science teachers and students in the selected secondary schools in Bo city. The respondents were given a period of time to complete the questionnaires .These were later collected .The statistical package for social sciences (SPSS) was used to analyse the data. Descriptive and inferential statistics were used to report the findings.

RESULTS AND DISCUSSION

Qualified and Unqualified Teachers Teaching Science in Schools in Bo City

Figures I and II depict the number of qualified and unqualified teachers teaching science in the selected schools in Bo city. The results revealed that 66.6%(10) of the teachers from MCSS were qualified, while 33.4%(5) were unqualified. Also, 73.3%(11) teachers from UCC were qualified, while 26.7%(4) were unqualified. About 80.0%(12) of the Bo school teachers were qualified, while 20%(3) were unqualified, Also73.3%(11) of the CKC teachers were qualified while 26.7%(4) were unqualified, and 60%(09) teachers from QRS were qualified while 40%(6) were unqualified.

Figures I and II below also revealed that Bo School and CKC, had more qualified science teachers compared to MCSS, UCC and QRS. This however cannot be unconnected with the fact that these are grade "A" schools and therefore most university graduates seek for employment in those schools. While schools like QRS, MCSS, UCC, do not only have more unqualified science teachers but even have teachers teaching science that are not science specialists

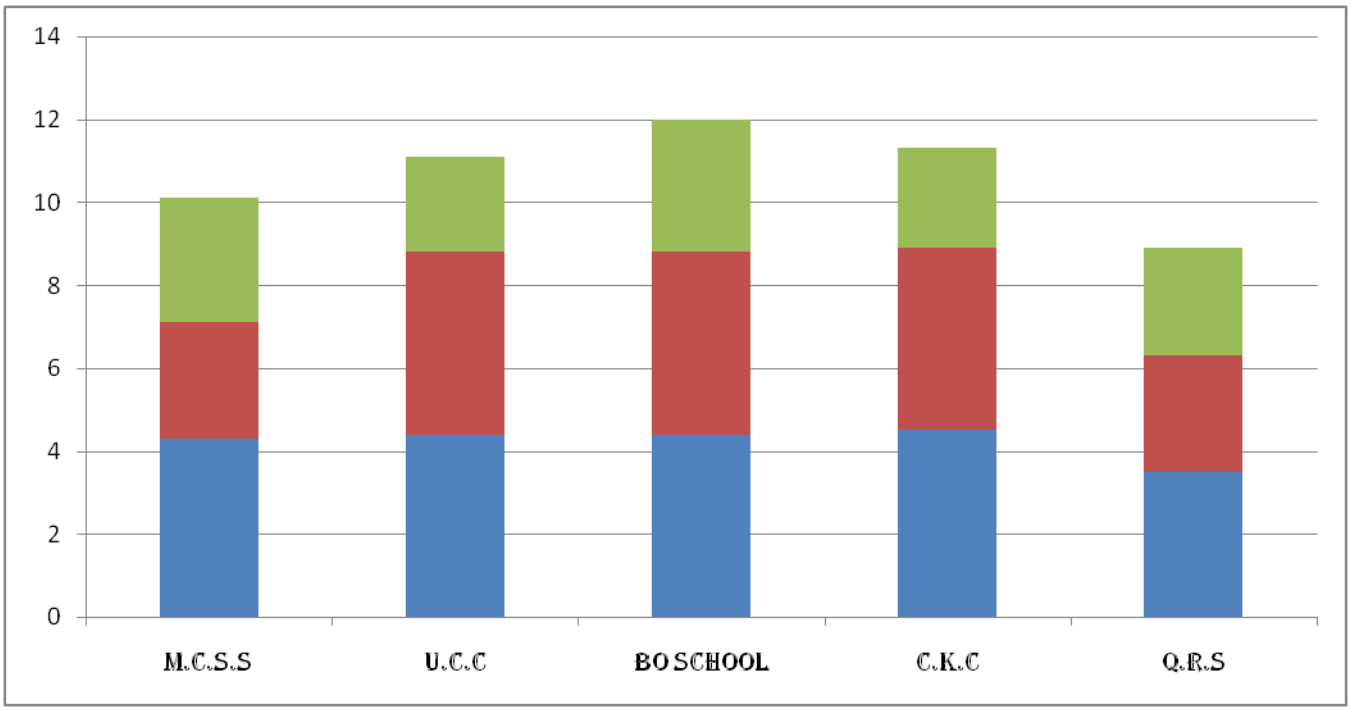
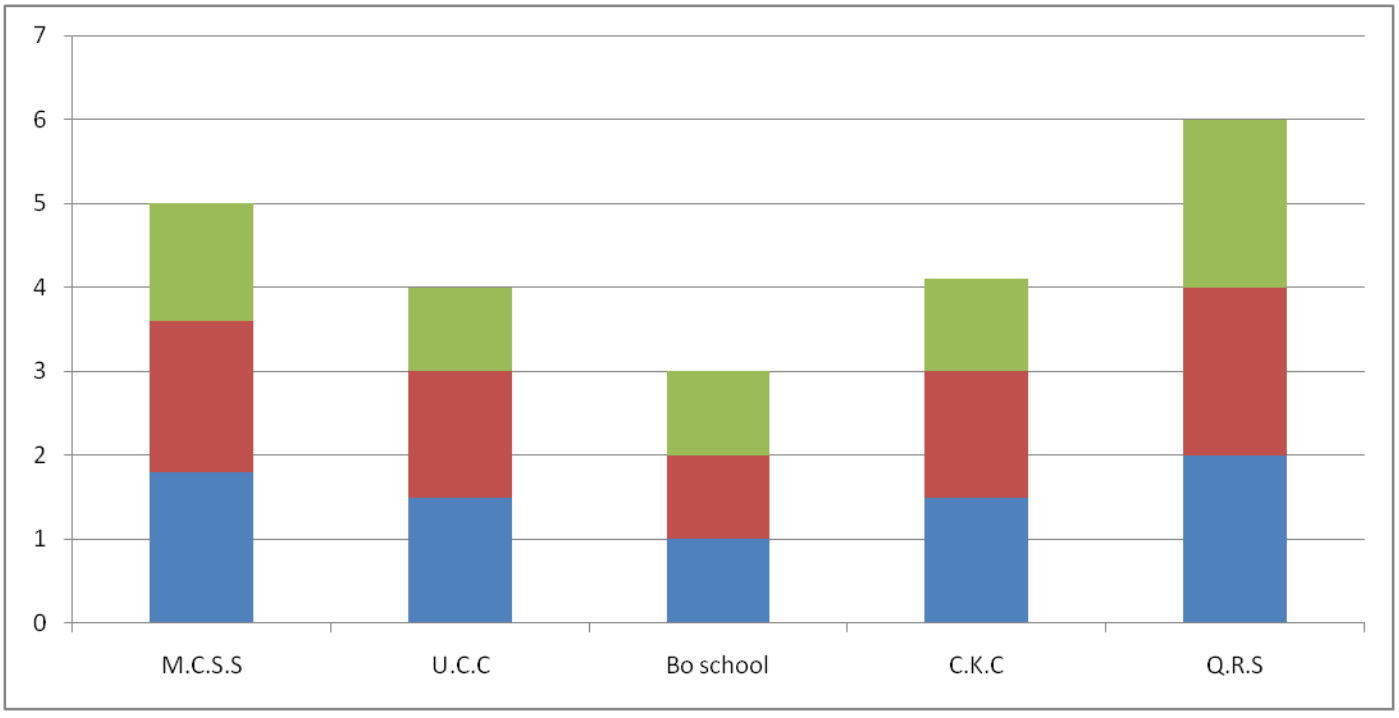


Figure I: Numbers of Qualified Science Teachers in the Selected Schools in Bo City



Figures II: Numbers of unqualified Science Teachers in the Selected Schools in Bo City

Academic Performance in Promotional Examinations for 2017/2018 in Science in the five (5) Selected Secondary Schools in Bo city

The Figure III below shows students' academic performance in science in promotional examinations in 2017/2018 academic year in the selected secondary schools. The findings revealed that 55 %(11) and 65 %(13) of UCC and QRS students were on the average, while 45 %(09) of the MCSS students were below average in performance. Moreover, CKC and Bo school students extremely performed well by 85 %(17) and 90 %(18) respectively.

The excellent academic performance of these two schools (CKC and Bo school) implies that they are grade "A" schools; these schools always accept and admit very good students with excellent results; also they have very good educational facilities with equipped laboratories and adequate furniture.They therefore academically perform better than the other schools. Schools like UCC, MCSS and QRS always admit weak students that have been turned down or denied by these grade "A" schools. The grades C and D schools lack a lot of educational facilities including trained and qualified science specialists and therefore academically perform poorly especially in public examinations.

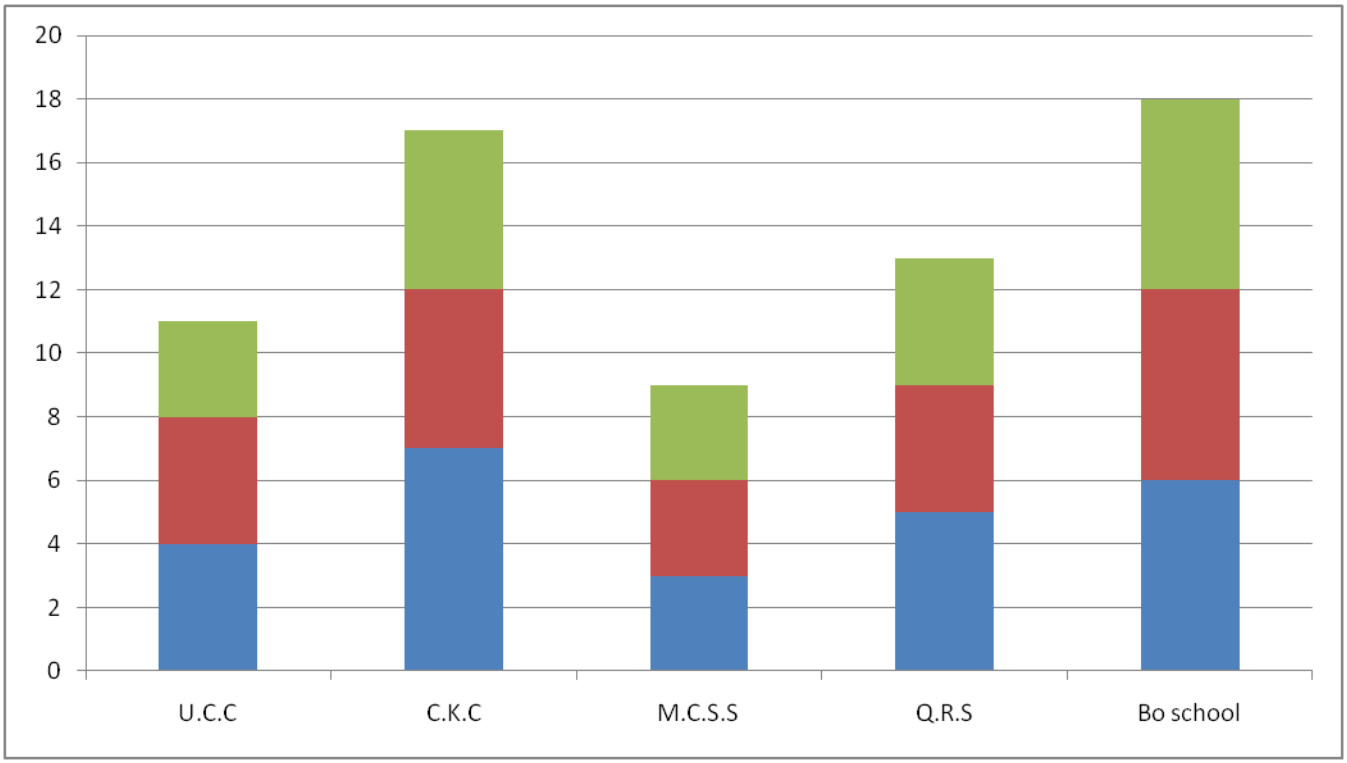


Figure III: Student Academic Performance in Promotional Examinations for 2017/2018 Academic Year

Students Attitude towards Science Subjects in Five Selected Secondary Schools in Bo City.

Figure IV, below indicates the various attitudes of students towards science subjects in the schools under investigation. The results showed that 60% of the students have good attitude towards all science subjects, while 70% have good attitude towards few science subjects. Also, 62% and 68% of the students have positive attitude towards class work and class participation respectively while only 52% of the students have good attitude towards assignment, tests and examinations. About 76% of the students have good reading and writing abilities, while 72% of them attend classes regularly and 45% of the students play truancy. The negative attitude of students towards science the selected schools is as a result of the concept formed about science been difficult. From the Figure, it is deduced that all the students have good attitudes towards class attendance, participation, assignments, reading and writing ability. But very few students have good attitude towards the science subjects and examinations in their disciplines. This is

because most students do not have interest in certain science subjects andwould not want to write tests or examinations in those disciplines. Thus, the fear of offering science subjects by students lead to all sorts of attitudes, mostly negative attitudes that subsequently affect their performances

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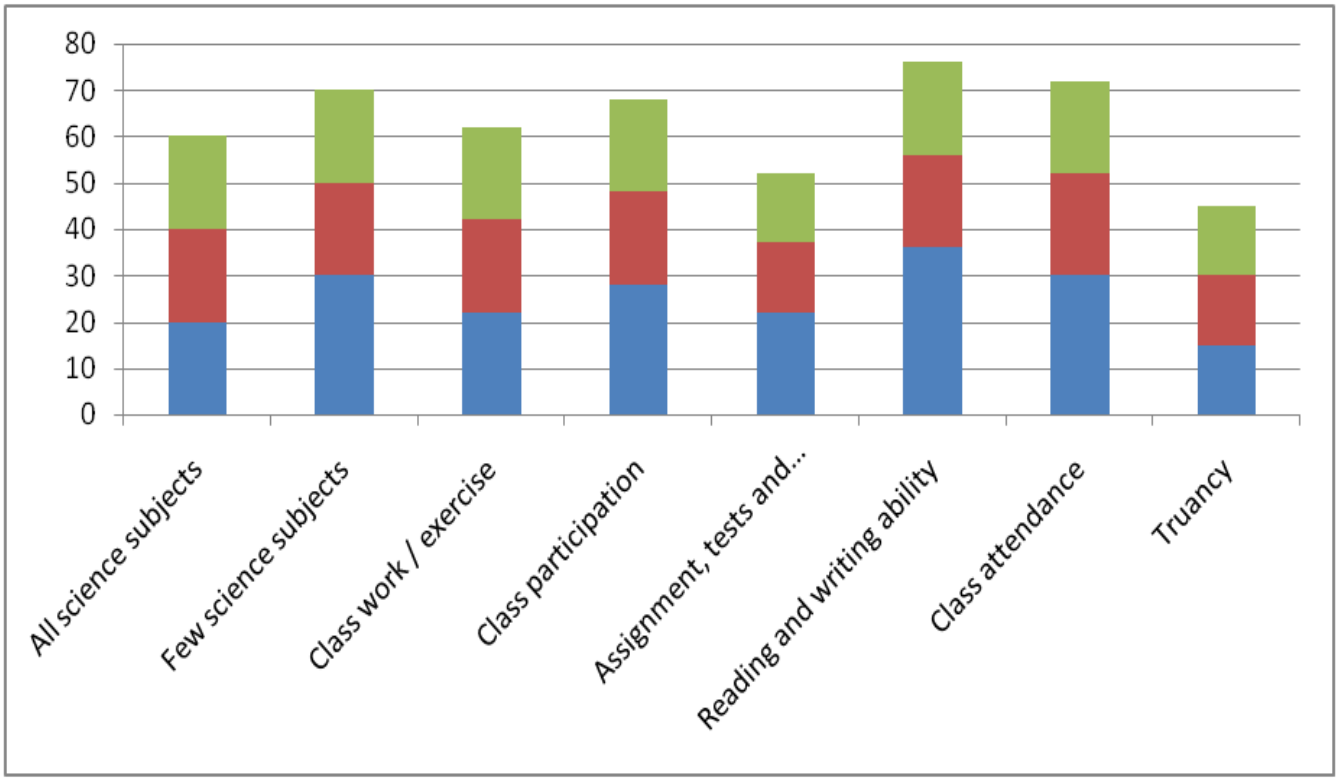

Figure IV: Attitudes exhibited by Students towards Science Subjects

The Problems Associated with Science Teaching and Learning in Five Selected Schools in Bo City

Figure V, below depicts the problems associated with Science Teaching and Learning in the five selected schools in Bo city. About 80% of the respondents indicated inadequate teaching and learning materials inthe five selected schools. Also 75% of the respondents stated ill-equipped science laboratories, while65% of the respondents indicated untrained and unqualified science specialists in the selected schools. About 85% of the respondents revealed that science teachers and students are not given incentives and motivation, while 60% of the respondents declared that some science teachers do not even understand what science is all about. About 80% of the respondents indicated high charges levied on extra science classes and very little time allocated on the timetable for science classes. About 67% of the students revealed that they attend classes regularly while 47% of them stated that they play truancy in their schools.

From the Figure below it is clear that the problems highlighted are not unconnected with students attitudes towards science and their academic performance, in other words, these problems are the major problems that impede science teaching in schools and therefore greatly responsible for the negative attitude and poor performance of students in science. However, these problems vary according to situation and status of the schools. Problems that are serious in some schools may not be serious in other schools.

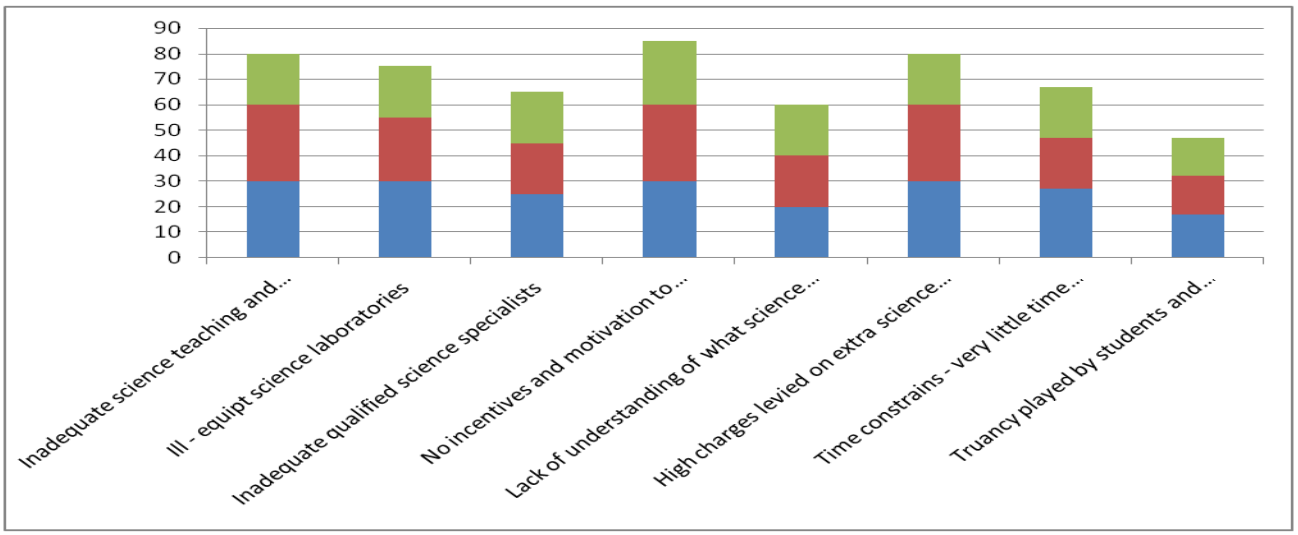

Figure V: Problems Associated With Science Teaching And Learning In Selected Secondary Schools In Bo City.

Suggestions to improve Science Teaching and Learning in the selected Schools

Figure VI, below indicates suggestions as to how the teaching of science will be improved in the selected secondary schools .About 90% of the science teachers and administrators suggested that science subjects be compulsory particularly for promotion, while only 10% of the students supported the suggestion. Also 80% of the students, teachers and administrators in the selected schools also suggested that incentives through special allowances be regularly given to teachers in order to motivate them to teach science. Also 85% of the respondents declared that Government should equip science laboratories, train and employ enough science specialists. That same percentage also indicated that provision be made for enough time to be allocated on the timetable for science classes. About 93% of the respondents stated that teaching and learning materials for science be available in all schools where science is offered as option.

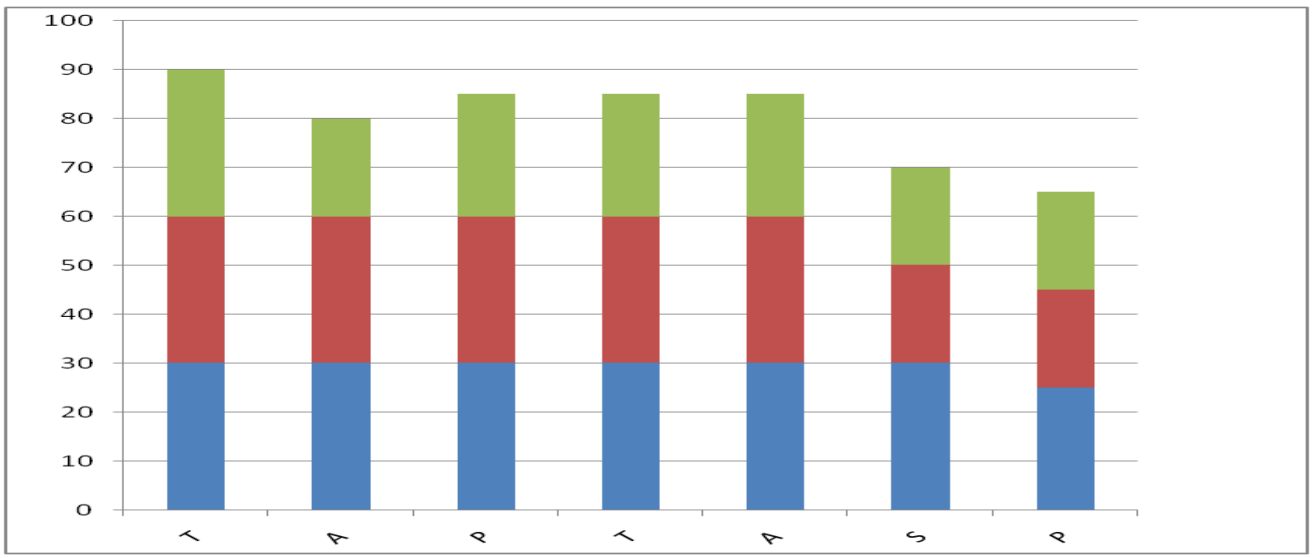

Figure VI: Suggestions to improve Science Teaching and Learning in the selected Schools

CONCLUSION AND RECOMMENDATIONS

Conclusion

It is concluded that the correlation between the attitude of students towards science and academic performance have low negative value. It was further concluded that there were some problems associated with student performance other than attitude; these include, lack of adequate teaching/learning materials, inadequate science specialists, ill equipped science laboratories, and lack of incentives and motivation for science teachers in schools.

Recommendations

1) Teaching and learning materials should be made available in all schools not only in Bo city but the country at large.
2) Adequate and well equipped science laboratories should be provided by the Government in all schools in the country.
3) Government should give incentives to science teachers through special allowances in order to motivate them to teach science.
4) Authorities concern should educate and sensitize pupils in primary and secondary schools on the importance of science in their community and the nation at large.
5) Colleges and universities should design special curriculum development centres for the schools in the country.
6) Government should train and employ enough science specialists in all schools in the country.
7) Government through school authorities and other education stakeholders should strictly restructure or discourage high charges levied on extra science classes in schools.
8) Further research should be conducted to cover the entire southern region of Sierra Leone regardless of age, sex and level.
9) Government and science educators should nurture students' attitude as this is related to academic performance.

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