Original Research Article

BIOLOGY EDUCATION IN PERSPECTIVE: AN INQUIRY INTO GHANAIAN SENIOR HIGH SCHOOL STUDENTS' ATTITUDE TOWARDS BIOLOGY PRACTICAL LESSONS

ABSTRACT

This study aimed at finding out the attitude of students towards Biology practical lessons in selected Senior High Schools in Ghana. The study adopted the descriptive sample design, involving both quantitative and qualitative research approaches. The population of the study comprised 408 students and 24 teachers. The students and teachers were chosen at random from a table of random numbers respectively. Data was collected using informal observation, questionnaire and documents. The questionnaire was made up of both open and close-ended questions. The Statistical Packages for Social Sciences (SPSS) version 23.0 was the software that was used in processing the quantitative data. The findings of the study revealed that 5% of students from well-endowed schools, as against 40.5% of those from less-endowed schools, indicated that they have poor attitudes towards Biology practical lessons and this was confirmed by their teachers. It was also shown that practical lessons in Biology, in both well-endowed and less-endowed Senior High Schools, were greatly impeded by lack of proper laboratory, lack of laboratory assistants/technicians and inadequacy of practical equipment and materials for practical work. Based on the findings of the study, the government, Parent Teacher Associations (PTAs) and other stakeholders should help in providing the needed resources such as well-equipped laboratories and materials among others to facilitate the teaching and learning of Biology practical in the schools.

Keywords: Biology Practical, Students' Attitude, Senior High School, Well-endowed, Less-endowed

1. BACKGROUND OF THE STUDY

Educational Reform Programmes in Ghana, since the country's independence in 1957, have advocated the traditional approach to scientific practical activities and advised that Science practical activities be laboratory-based (Kuyini, 2013). All Senior High Schools (SHS) must be equipped with laboratories that are well-stocked with appropriate equipment and apparatus in order to attain this goal. Unfortunately, a detailed examination of some Senior High Schools in Ghana discovered that they lack Science laboratories. Even schools that have Science teaching laboratories lacked the necessary equipment. Further observations made regarding having practical lessons in Biology in the various Senior High Schools revealed that the current approach to teaching Biology is mostly based on classroom and laboratory work that is designed solely to meet examination criteria (Ackon, 2014).

Meanwhile, as it is well known, a practical work is an important part of studying the natural sciences. The "hands-on" method has the potential to pique students' interest in the subject, teach laboratory skills, improve knowledge acquisition, and provide insight into scientific attitudes and goals. According to Jeronen, Palmberg and Yli-Panula (2017), a practical work is typically done in school science for a variety of reasons. Some of these motivations include gaining a better understanding of events via experience and developing critical and disciplined attitudes. It is also done to hone certain manipulative abilities and clarify theoretical work as a learning aid (Beatty & Woolnough, 2010). All of these advantages are lost if Biology lessons are solely based on literary approaches.

Although teachers are supposed to employ practical lessons to help their pupils get better outcomes in biology, preliminary observations show that in most schools, the biology laboratories are only used for theory lectures, but not practical teachings. This was due to a lack of materials and equipment that were required for practical lessons in the laboratories (Serwaa, 2007). Even though various studies (Anamuah- Mensah, 1998; Quist, 1999; Ahorlu, 2013; Ackon, 2014) were carried out in the 1990s and 2000s to research the issue in the study region, there appeared to be a growing worry about the lack of Biology practical classes in some Ghanaian Senior High Schools. For these reasons, this study looked into and compared students' attitudes to biology practical activities in a few well-equipped and under-equipped Senior High Schools in Ghana.

2. STATEMENT OF THE PROBLEM

Despite the Ghanaian government's numerous legislative provisions and other attempts to emphasize science education as the country's engine for growth and development, its progress has fallen short of expectations (Ntiamoah, Li & Kwamega, 2016). If effective student learning is to be attained, teachers must adhere to certain norms when teaching and learning Biology which forms part of science. Practical teachings are an important part of biology education (Eddy, Converse & Wenderoth, 2015). Literature in this area appears very scanty and as a result, our knowledge of what biology teachers do in the classrooms or laboratories is very limited. As a result of the paucity of literature in this field, our understanding of what Biology teachers accomplish in the classrooms or laboratories is severely constrained. Only a few research efforts have been devoted to comparing the standard of Biology practical teaching in well-endowed Senior High Schools with standards in less-endowed Senior High Schools, according to the literature in this area. As a result, greater research efforts should be dedicated toward this critical aspect of science education. At this juncture, the critical question the current study seeks to answer is: whether there are any differences in students' attitudes toward Biology practical lessons in the chosen well-endowed and less-endowed Senior High Schools in Ghana?

3. RESEARCH QUESTIONS

The following questions were addressed by the study:

a. What kinds of attitudes do students from the selected well-endowed and less-endowed Senior High Schools have towards Biology practical lessons and how did such attitudes influence their skills development?

b. What are the problems encountered by students from the selected well-endowed and less-endowed Senior High Schools during Biology practical lessons and how could such problems be addressed?

4. SIGNIFICANCE OF THE STUDY

The information obtained from the study may uncover the problems and challenges that hinder the use of practical work in the teaching and learning of Biology. Again, the study may afford teachers in SHS the opportunity to engage, encourage and involve their students in practical-oriented lessons. The study may also provide very useful information to the Ministry of Education (M.O.E.), government and other educational authorities and agencies to provide interventions to promote practical lessons in Biology. It may be used to formulate educational policy at this level aimed at improving Biology teaching and learning in our senior high schools. Furthermore, the research may help the curriculum planners to design effective Biology curriculum for the schools. Additionally, the findings may augment the pool of data required by other Educational Researchers in their bid to design interventions to solve educational problems in the sciences in general and Biology in particular.

5. LITERATURE REVIEW

5.1 Overview of Science Practical Work

When it comes to the natural sciences, such as Biology, Chemistry, and Physics, practical works or 'hands-on' activities are vital component. Practical work is founded on the premise that learning by doing is the most effective way to gain scientific abilities. The "hands-on" method can pique students' interest in the subject, teach laboratory skills, improve information acquisition, and provide insight into the development of scientific attitudes and skills. According to Freedman (2009), students' motivation to learn Biology is not solely based on their interests. It could also be a result of specific learning conditions, such as laboratory work. At least two arguments have been found in science education research to support the incorporation of real-life situations in science classes. First, real-world science applications have been found to aid students in reconciling their past knowledge of the world based on their experiences with scientific explanations. Studies of science learning as a process of conceptual transformation, as well as studies of knowledge transfer, imply that in order to grasp the meaning of ideas and concepts, students must apply them in a variety of real-world contexts (West & Pines, 1995; NRC, 2000; Gardner, 2003; Posner, Strike, Hewson & Gertzog, 2012; Wandersee, Mintzes, & Novak, 2014). Second, research indicates that real-world applications may be an effective method to pique students' interest in science (Simon, 2000; McComas, 2016;). According to learning theory, students are more engaged in their learning when they see the practical importance of the subject they are studying (Pintrich & Schunk, 1996; McCombs, 2016; Posner et al., 2012). Many studies show that students' curiosity is piqued when they participate in real-world science projects and research (Barron et al., 1998; Krajcik et al., 1998; Roth & Roychoudhury, 2014; Johnson & Johnson).

Students might be engaged by doing hands-on practical exercises (Freedman, 2009). Despite the fact that many students lose interest in science classes beyond the age of 11 because they find school science boring (Hadden & Johnstone, 2013; Yager & Penick, 2016), studies consistently report that hands-on laboratory work is the most appealing

aspect of science (Millar, LeMarechal & Tiberghien, 2009; Molyneux-Hodgson, Sutherland & Butterfield, 2009; Myers & Fouts, 2012). Most educators hold Biology in high regard among the sciences, not only because of its instructional value but also because of its close association to humans as living organisms, the unique field of experimentation, and interrelationship with other vocation sciences. It has been discovered to be the most common route to careers in medicine, pharmacy, agriculture, dentistry, and a variety of other fields.

In Ghana, it is general knowledge that Biology has a greater enrolment rate than Chemistry and Physics in senior high schools in recent years. These high numbers, however, do not correspond to students' Biology achievement. There is also sufficient proof that the majority of students fail Biology because they do poorly in Biology paper 2, which is a practical paper. This paper puts one's sketching, identification, and classification skills, as well as their ability to analyse some processes and evaluate biological facts to test. For example, the Chief Examiner's report of the West African Examinations Council (WAEC) has identified various deficiencies in biology students' performance during the years (2010-2020). Among the deficiencies reported including the following:

1. The responses of the candidates indicate that they have not received appropriate practical training.
2. The responses of the students show that they have not completed any practical work related to the tested questions.
3. Candidates created characteristics that were not visible to the naked eye. As a result, they only answered the practical issues using the theory they had learned.
4. The quality of the students' drawings was poor, indicating that they did not practise biological drawing as needed by the practical exam.

This appears to imply that students were either not given enough practical work or were not taking the practical work seriously. Biology is a unique study in that it involves both laboratory and field studies with living creatures. However, there has recently been evidence of an increase in the use of virtual settings rather than practical experiments in Biology (Partridge, 2003; Tranter, 2014). Biology is one of the Key Learning Areas (KLA) of Science Education's among the elective subjects. Its curriculum provides a variety of balanced learning experiences through which students are expected to develop the necessary scientific skills and processes, values and attitudes, knowledge and understanding embedded in the 'Life and Living' strand and other strands of science education for personal development and to contribute to the construction of a scientific and technological world.

5.2 Attitudes of students towards Biology practical lessons

The concept of attitudes is very complex and difficult to measure (Page-Bucci, 2013). Many definitions and explanations have been put forward in many areas of learning; including Social Psychology and Social Science. There seems to be an interrelationship between beliefs and attitudes. The attitudes toward Science may be viewed as a more purposeful way of summarizing a wide range of beliefs about Science which in turn allows the prediction of Science related behaviour. Scientific attitude implies certain ways of approaching problems. It also implies an attitude of wanting to find explanations that are secular and do not refer to authority (Schreiner & Sjoberg, 2004). An Attitude toward Science, however, may be viewed as a wide variety of beliefs about Science.

The investigation of students' attitudes towards studying Biology (Science) has been a substantive feature of the work of the science education research community for the past 30-40 years. Its current importance is emphasized by the now mounting evidence of a decline in the interest of young people in pursuing scientific careers (Department for Education, 2004; Smithers & Robinson, 2008). Combined with research indicating widespread scientific ignorance in the general populace (Durant & Bauer, 1997; Miller, Pardo & Niwa, 2007), and an increasing recognition of the importance and economic utility of scientific knowledge and its cultural significance. The falling number of students choosing to pursue the study of Science has become a matter of considerable societal concern and debate (House of Lords, 2000; Jenkins, 2014; Lepkowska, 2016). Consequently, the promotion of favourable attitudes towards science, scientists and learning science, which has always been a component of science education, is increasingly a matter of concern. Several studies have been carried out with a focus on students' attitudes toward a particular discipline, such as Physics (Angell, Guttersrud, Hendrickson & Isnes, 2004) or Chemistry (Salta & Tzougraki, 2004) and a few focusing on students' attitudes toward Biology (Spall, Stanisstreet, Dickson & Boyes, 2004).

6. RESEARCH METHODOLOGY

6.1 Research Design

The study employed a descriptive sample survey as its research design. According to Nardi (2018: 37), a descriptive sample survey comprises obtaining data in order to test hypotheses or answer questions regarding the current state of the research issue. Babbie (2001) also suggests using a descriptive sample survey to generalize from a sample of a community in order to make references to some of the group's characteristics, qualities, or behaviour. Since the purpose of the study is to survey and compare the attitudes of students towards Biology practical work in the two categories of SHS in Eastern and Central Regions of Ghana, the descriptive sample survey is deemed the best for the current study.

6.2 Population

The survey comprised all science teachers and students from 12 SHS in the Eastern and Central Regions of Ghana. On the other hand, the available population consisted of all Biology teachers and students from the selected schools. In total, 432 people were involved in the study, including 408 students and 24 teachers.

6.3 Sample and Sampling Technique

A total of 408 pupils and 24 teachers were chosen as a sample from the 12 SHS. As it is a comparative study, the number of students and teachers in each SHS was picked at random, regardless of the student and teacher population. In this study, 34 students from each of the participating SHS, as well as two Biology teachers from each of the schools, were chosen. Six well-equipped schools (those with adequate facilities and equipment) and six under-equipped schools were chosen (schools deficient in the basic infrastructure and equipment) were chosen. Using a table of random numbers, the schools were sampled by counting numbers from a list of schools at random intervals. In the same way, students and teachers were chosen at random from a table of random numbers.

6.4 Instrumentation

Informal observation of several Biology practical lessons, document analysis, and questionnaires were the main instruments utilized in the study to obtain views, opinions, and suggestions. An informal instrument was employed by the researchers to observe some biology practical lessons on random basis. This method, according to Johnson (2008) and Smith (2012), does not need the use of a check list; instead, a free-form style of data recording is used. This kind of recording allowed the researchers to get as near to a complete picture of what happened during the observed lessons as feasible. A detailed analysis of some study-related documents was also carried out. Biology curriculum and materials, such as textbooks and syllabuses, were among the documents examined. WAEC Chief Examiners' Reports from 2010 to 2020 were also used. There were two sets of questionnaires created: one for teachers and one for students. Open-ended and closed-ended items were included in both sets of surveys. The Closed-ended questions included multiple possible answers, and respondents were asked to tick the right choice. On the open-ended surveys, respondents were expected to provide their own type of responses in the spaces provided.

6.5 Validity

According to Joppe (2000), validity determines whether a study instrument accurately assesses what it was supposed to measure. To ensure that the questionnaires' content and face validity were confirmed, they were sent to an expert in Educational Psychology, who carefully reviewed the content and made the necessary adjustments. The questionnaires were validated and the content and face validity of the items were determined using experts in Science Education and English Education, respectively.

6.6 Reliability

A pilot test of the instrument was done in the Eastern Region of Ghana with twenty (20) students pursuing elective biology at Mpraeso Senior High School. The school was chosen since it was not part of the main study but has shared features with the Senior High Schools in the identified Regions. The researchers were able to alter the questionnaire as a result of the pilot study, making it easier to elicit the expected responses. The reliability of the students' questionnaire was tested using the split half method. The questionnaire was split into two halves and given to certain non-research subjects to complete. Both sets of outcomes were linked. This resulted in an internal consistency of 0.83, according to Pearson's product moment correlation calculation. This was then compared to the tabulated coefficient of reliability, which Bryman and Cramer (2001) determined to be satisfactory at 0.8. As a result, the instrument's internal consistency (reliability) was calculated and determined appropriate.

6.7 Data Collection Procedure

The questionnaire was administered by the researchers themselves. The researchers were able to communicate directly with the respondents and form relationships with them as a result of this. It also gave them the opportunity to explain other parts of the questionnaire items that the respondents seemed to have problem with. A one-week time frame or interval was allowed following the delivery of the questionnaire to respondents so that they may respond not only as promptly as possible, but also at their own leisure. In addition to the administration of the questionnaires, the researchers observed some Biology practical lessons in each of the selected SHS.

6.7. Data Analysis Procedure

In keeping with current or recent developments in the learning environment in relation to the classroom, this study used both qualitative and quantitative approaches to analyze the data acquired (Fraser & Tobin, 2011). The qualitative data was thematically analyzed, while the quantitative data was analyzed using the Statistical Package for Social Sciences (SPSS) version 23. Brannen (2017) contend that combining qualitative and quantitative research approaches results in distinct theoretical perspectives (observational and interpretive methods) on education in general and the classroom in particular. The inclusion of both qualitative and quantitative measures in a study is often seen as enriching the study. (Fraser & Tobin, 2011; Ofori, 2019).

7. RESULTS

In presenting the findings of the study, coding schemes were developed to organize the data into meaningful and manageable categories. This included data from questionnaires, document analysis, and informal observations. The data was then categorized and transformed into frequency counts and simple percentages, which were then used to answer the research questions. The results are presented as follows:

Research Question 1: What kinds of attitudes do students from the selected well-endowed and less-endowed senior high schools have towards Biology practical lessons and how did such attitudes influence their skills development**?**

The research question sought to find out the kinds of attitudes students from the selected well-endowed and less-endowed SHS have towards Biology practical lessons and how such attitudes influence their skills development. The responses are presented in Table 1.

Table 1: Views of Students on Their Attitudes towards Biology Practical Work

Attitudes	Students in Well-Endowed Schools		Students in Less-Endowed Schools	
	Frequency	Percentage %	Frequency	Percentage %
Poor/negative	10	5.0	83	40.5
Very poor/negative	5	2.5	20	10.0
Positive/good	182	89.1	100	49.0
Very positive/good	7	3.4	1	0.5

It can be seen from Table 1 that 5% of students from well-endowed schools as against 40.5% of those from less-endowed schools indicated that they have poor attitudes towards Biology practical lessons and this was confirmed by their teachers. In the case of the attitudes being "very poor/negative", it was 2.5% for students from well-endowed schools as against 10% response by students from less-endowed schools. Students who indicated that their attitudes towards practical work in biology were "poor" or "very poor" gave some reasons. One major reason cited by those students for having such levels of negativity in attitudes towards practical work was that their science laboratories lack almost all the necessary basic equipment. Some even indicated that their schools did not have a laboratory for science practical work. The idea of students having a "positive or good" attitude towards practical work tilted greatly in favour of students from well-endowed schools with a high percentage point of 89.1 as against 49% of those from less-endowed schools. A 3.4% response was recorded for students from well-endowed schools as against 0.5% for their counterparts from the less-endowed schools when it came to students having a "very positive" attitude towards practical works in Biology.

Research Question 2: What are the problems encountered by students from the selected well-endowed and less-endowed senior high schools, during Biology practical lessons and how could such problems be addressed?

The purpose of this research question was to find out the problems encountered by students during Biology practical lessons and how such problems could be addressed. The responses provided were coded under the following: lack of proper laboratory (LPL); lack of laboratory assistant or technician (LLAT); lack/inadequacy of practical equipment and materials (LIPEM); large class size (LCS); insufficient time for practical work (ISTPW); non availability of some specimen in the locality (NAS); lack of funds (LF); malfunctioning of equipment and expired chemicals (MFE); and others. The responses are represented in Figure 1.

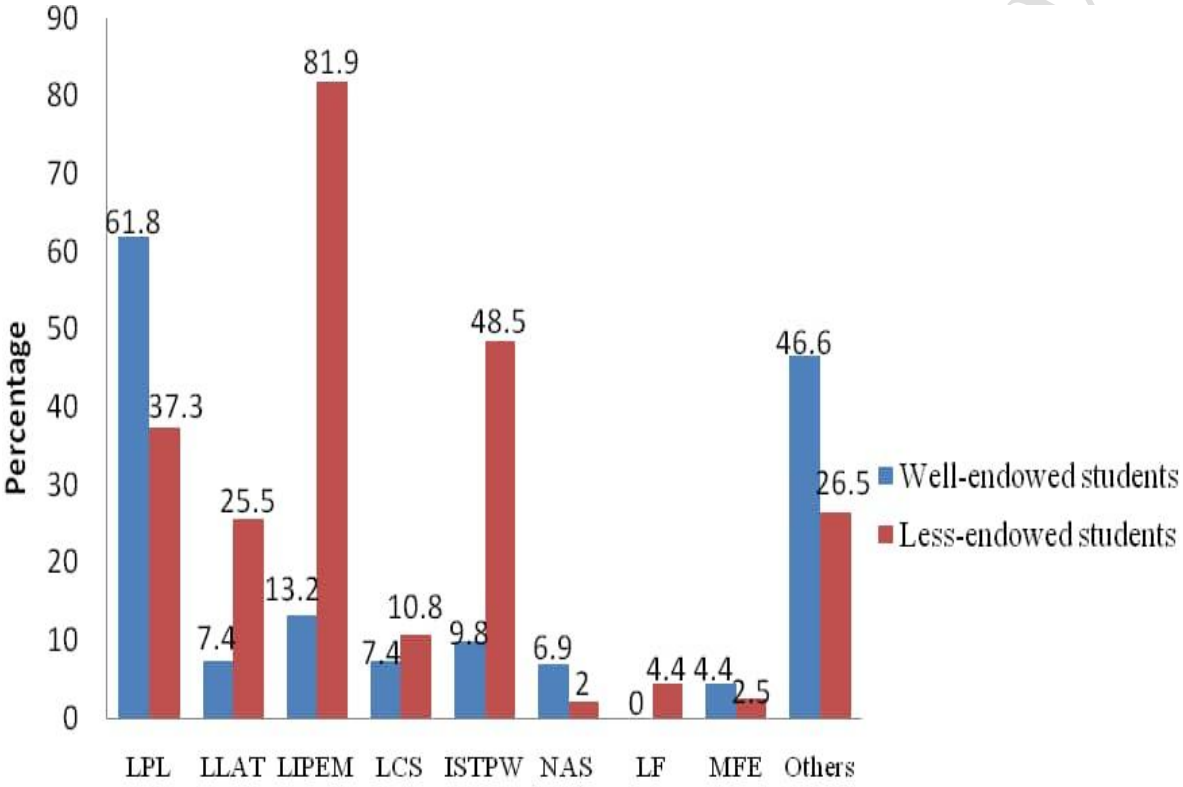

Fig. 1 : Comparison of Students' Views on Problems They Encounter During Biology Practical Lessons

From Figure 1, 61.8% of students from well-endowed schools as against 37.3% of their counterparts from less-endowed schools stated that one of the problems they encountered was that they lack proper laboratory (LPL) for practical work in Biology. With respect to the lack of laboratory assistants/technicians (LLAT), 7.4% of students from well-endowed schools responded in the affirmative. For students from less-endowed schools, about a quarter of the population, 25.5% supported this view, which in the opinion of the researchers was not encouraging as the value of school laboratory assistants in the laboratory can never be underestimated.

When it came to the problem of lack/inadequacy of practical equipment and materials (LIPEM), 13.2% of students from well-endowed schools responded positively. This was

strongly confirmed by 81.9% of their counterparts from less-endowed schools. On the contrary, 7.4% of students from well-endowed schools indicated large class size (LCS) as the problem they have been encountering during Biology practical lessons as against 10.8% of those from less-endowed schools. In terms of insufficient time for practical works (ISTPW) being one of the problems encountered, 9.8% of students from the well-endowed schools responded positively; an opinion confirmed by 48.5% of their counterparts from the less-endowed schools. Non- availability of some specimens (NAS) in the locality was a problem faced by 6.9% of students from the well-endowed schools with only 2% of those from the less-endowed schools in favour. Regarding the problem codified lack of funds (LF) for procuring the necessary apparatus, 4.4% of students from the less-endowed schools responded affirmatively. This assertion, however, was not supported by any of their counterparts from the well-endowed schools.

The responses of students, in line with the problem of malfunctioning equipment and expired chemicals (MFE), were 4.4% and 2.5%, respectively for students from the well-endowed schools and those from the less-endowed schools. Nonetheless, 46.6% of students from well-endowed schools and 36.5% of their counterparts from less-endowed schools mentioned other forms of problems they encountered apart from those that have been cited already. These were codified as "Others". Some of the other problems they stated include "bad odour from chemicals" which tend to put them off or make them uncomfortable in the laboratory, "difficulty in drawing directly from a microscope observation", "non-cooperation" of some members of the group during Biology practical lessons, "not having fieldtrips and excursions" as well as "improper supervision by lab assistants".

To address the identified problems, the responses given by both teachers and students were categorized into the following: Provision of more / necessary equipment and materials by stakeholders (PE); Recruitment of well-educated lab technicians / assistants (RLTA); Adjustment in time allocated for practical work (AT); Provision of proper / well-equipped lab (PL); Parents to provide the necessary practical kits for their wards (PKW); Making class size more manageable (MCSMM); Refurbishing the existing science resource centres (RESRCs); and Others. The responses in this regard are represented in Figure 2.

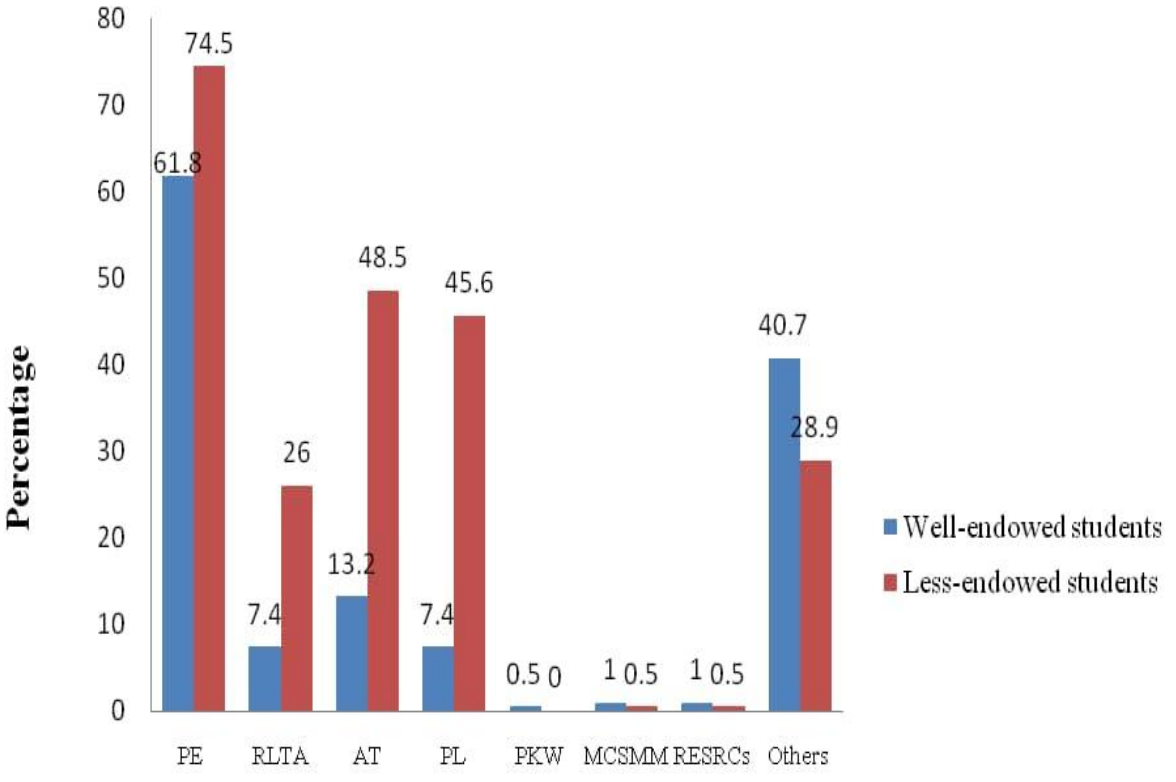

Fig. 2 .: Comparison of Students' Views on Things to do to Solve the Identified Problems

As shown in Figure 2, 61.8% of students from the well-endowed senior high schools as against 74.5% of their counterparts from the less-endowed schools identified the provision of more and necessary equipment and materials (PE) by all stakeholders in education as one of the measures to better their lot with respect to Biology practical works. In terms of recruiting of well-educated lab technicians and assistants (RLTA) to help both students and teachers with the practical work, 7.4% of students from the well-endowed senior high schools supported that statement as against 26% of those from the less-endowed schools. A population of 13.2% of the students from well-endowed schools, with 48.5% of those from the less-endowed schools agreed to the need for an "adjustment in the time allocated for practical works" (AT) as one of the things to do to enhance students' understanding of scientific concepts.

Again, in figure 2, only 7.4% of students from the well-endowed schools as against 45.6% of those from the less-endowed schools indicated the "provision of proper / well-equipped laboratory" (PL) as one of the key areas in solving the identified problems. On the question of "provision of necessary practical kits" (PKW) by parents to their wards as one way of solving the problems the responses from both categories of respondents fell below expectation. 0.5% respondents from well-endowed schools as against none from the students from the less-endowed schools expressed the need for parents' involvement. As indicated in figure 2, only 1% of students from the well-endowed schools as against 0.5% of those from the less-endowed schools identified the "making of class size more manageable" (MCSMM) as one of the solutions to the plethora of problems above. The responses recorded from both categories of students, concerning "refurbishment of the

existing science resource centres" (RESRCs) as one of the solutions to the identified problems were not encouraging at all. Out of the total number of respondents who gave their responses, 1% and 0.5% respectively from the well-endowed schools and the less-endowed schools saw parents' involvement as a measure to arrest the situational problem. Moreso, 40.7% of students from well-endowed schools as against 28.9% of those from less-endowed schools, suggested something else ("Others") apart from the enlisted solutions mentioned above. The "Others" include; having more fieldtrips and excursions, motivating both students and teachers especially, to give off their maximum best, old students coming together to donate funds to purchase the needed equipment, as well as pleading with teachers to teach wholeheartedly.

8. DISCUSSIONS

The research findings showed that practical lessons are considered one of the most effective ways of teaching and learning Biology by both teachers and students from the selected well-endowed and less-endowed SHS. Despite the fact that the number of students from the selected well-endowed schools had more favourable views toward practical lessons in Biology than those from the selected less-endowed schools, the study found out that the majority of students had good attitudes toward practical lessons in biology. Students who even indicated that they have negative attitudes toward the subject in question said that their rather poor attitudes were developed as a result of the frustrations they had to endure due to the non-availability or inadequacy of the appropriate biological equipment, materials and specimen in their Science laboratories. This observation is in line with that of Giorgi (2005). In his submission, Giorgi indicated that Ghanaian school children spent a significant amount of time learning in school and that majority of them had a positive attitude towards practical lessons. When most schools are able to supply significant Science curriculum materials and equipment, this favourable attitude among students will undoubtedly grow. In the long run, this will have a positive impact on the students' academic performance (Osborne, Simon & Collins, 2003; Laursen et al., 2007).

There were a host of problems that confronted both the teachers and students in the course of having practical lessons in Biology. Some of the identified problems include; lack of proper laboratory, lack of laboratory assistants or technicians, lack/inadequacy of practical equipment and materials, large class size, insufficient time for practical lessons, non-availability of some specimen in the locality, lack of funds, malfunctioning of equipment and expired chemicals. This finding is not surprising as Kitinoja et al., (2011) state that developing countries such as Ghana usually lack funds to procure equipment for practicals. Respondents also mentioned some measures that could be done to address the identified problems. These include; provision of more/necessary equipment and materials by stakeholders, recruitment of well-educated lab technicians/assistants, adjustment in the time allocated for practical lessons, provision of proper/well-equipped laboratories, parents to provide the necessary practical kits for their wards, making class size more manageable and refurbishing the existing science resource centres. It also appears that school authorities do not have interest in the provision of science materials and equipment. For their schools. The excuse they gave was that there were no funds for such purchases. According to the respondents, school authorities only tried to procure the needed Science materials during WAEC designated examinations, a situation that is not helping both teachers and students at all.

According to Jeronen, Palmberg and Yli-Panula, (2017), this behaviour on the side of school administrators in reference to the approach employed in Biology education does not allow students to develop their creative potentials. Levy and Petrulis, (2012) believe that rather than being spoon-fed information, teachers in Science education should urge pupils to seek information on their own through activities. He added that when students are given more materials and are involved in the majority of the activities during class, they not only learn to be curious and creative, but also gain more relevant knowledge.

9. CONCLUSIONS

The findings of the study suggest that the most successful approach of teaching and learning Biology is through practical activities, as students learn most effectively by doing. In the researchers' opinion, all stakeholders in education must make the necessary efforts to provide well-equipped laboratories for all SHS. This will allow teachers and students to cultivate a positive attitude and effectively teach and understand Biology through practical lessons. It may be posited that insufficient supply of equipment and materials to enhance practical lessons, especially in Biology has had a negative impact on the arrangement of Biology practical activities in the surveyed schools. It is essential to give enough time slots to favour more practical work in order to pique students' interest in Biology practical lessons. As a result, this has become a major source of worry that has to be addressed by all stakeholders in education. If huge classrooms are divided into more manageable units, much progress could be achieved.

10. RECOMMENDATIONS

Based on the findings of the study, the following recommendations are proposed:

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1. Headmasters and headmistresses should try as much as possible to motivate their teachers and students intermittently to reinforce their interest in practical lessons.
2. Teachers should introduce field trips and excursions as part of their Biology teaching and learning programmes. This will help students to get first-hand experience of the tools and equipment that may not be available in their schools.
3. The government, Parent Teacher Association (PTA) and other stakeholders should help in providing the needed resources such as well-equipped laboratories and materials among others to facilitate the teaching and learning of Biology practicals in schools.

11. SUGGESTIONS FOR FURTHER STUDY

Since society continues to be dynamic with continuous changes in societal needs, there is always the need for further research to be conducted into many aspects of education at all levels to meet the aspirations of the society. It is therefore recommended that:

1. a study should be conducted to find out whether gender has any influence on the teaching and learning of Science in general and Biology in particular at the senior high level.
2. more work needs to be done to find out whether student and teacher motivation could have an influence on the teaching and learning of Science at the senior high school level.

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