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Students' Motivation and Methods of Teaching and Learning Integrated Science in Senior High Schools of Cape Coast Metropolis

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Abstract:
The paper assesses assess students' motivation and method of teaching and learning the integrated science in some selected senior high school in the Cape Coast metropolis. The paper was developed from three objectives: to assess how students are motivated to study integrated science; to determine whether the teaching and learning environment is conducive for the study of the subject and to assess whether the methods used in teaching the subject promote effective teaching and learning. Descriptive survey design was used. The target population was students and tutors of the selected schools for the study. The study was conducted in the context of four (4) selected Senior High Schools located within the Cape Coast Metropolis. The total population was 128, made up of 120 form two integrated science students and 8 integrated science teachers. It was found that students' motivation for teaching and learning of integrated science was relatively low. It also emerged that the dominant teaching methods are note dictation and somewhat discussions. Little emphasis is placed on experiment in the teaching and learning. The students generally showed that their preferred method of teaching is experimental teaching and learning contrary to what is actually happening in their class room. These findings explain why these students do not have interest and desire in the subject. It is recommended that government and parent teachers association (PTA) should jointly contribute to resource science centres to boost students desire and interest in science. Visual aids and other computer imaging could be introduced to supplement the absence of fully equipped science resource centres. These could motivate students to marry the study of integrated science.

Keywords: *Students' motivation, methods of teaching, integrated*

1. Introduction

One of the key pillars in the development of every nation is education. In view of this, the accessibility of good and quality education for national development cannot be underestimated. The growing nature of modern technology and the dynamism in high school education is making many educational institutions adopt new trend of expanding teaching and learning (Schwarzer, 2014). Moreover, the greater coverage of the internet has led to improvement in the use of modern educational technologies like e-learning platforms and digital communications technologies and other forms of teaching and learning methodologies. These technologies have not only lessened the difficulties in teaching and learning but have also simplified the traditional mode of classroom education (Moore & Kearsley, 2011). In spite of this technological growth, teaching and learning of various subjects in senior high schools especial in Africa and for that matter Ghana, continues to face numerous challenges. Ones of such subjects within the Ghana and the sub-region in general is the teaching and learning of integrated science (Sun & Rueda, 2012).

It is important to study integrated science because it impacts the development of students through innovation of ideas and contributes significantly to the invention products. Integrated science does not only put current events in perspective, but it helps us understand the scientific process of life (Lambert, 2011). In fact, science is an inevitable ingredient for innovation and invention in today's world. Thus, a growing demand for specialized and practicing scientists abounds, as well as the need for others to be educated in the fields of science. Chepkorir, Cheptonui and Chemutai (2014) noted that there is quick rise in scientific knowledge, which has resulted in the incorporation of new materials into the school syllabus. According to Standish (2009), integrated science helps to understand and appreciate the incredible diversity of nature around the world. Integrated science has a fundamental relevance to young people because it relates to many However, there are many challenges to effective teaching and learning of integrated science. The first problem is the kind of resources teachers in public schools in use to teach integrated science (Stohlmann, Moore & Roehrig, 2012). In addition, Savery (2015) also indicated that, a well-planned and imaginative use of visual aids in lessons should do much to bearish apathy, supplement inadequacy of books as well as arouse students interest by giving them something practical to see and to touch while at the same time helping to train them to think out themselves.

Daily observation of science teachers in the classrooms indicate that most of the teaching skills science teachers acquired before certification are not put into practice. The deficiencies in science teaching range from; non coverage of contents in schemes of work, non-giving and marking of assignments, non-supervision of instruction, non-organization of

practical lessons, non- organization of extra lessons to cover lost grounds, non-assessment of learning outcomes regularly, non-application of improvisation knowledge in instruction to non-taking out of students to field experiences (Roehrig, Moore, Wang & Park, 2012).

Again, all these tend to suggest that teachers are to be blamed for the lack of proper exposure of the science students-which result in poor learning outcomes among the science students. There are varieties of materials for the teaching and learning of chemistry. Some of these materials include conical flasks, computers, Bunsen burner, burette, pipette, distilled water, litmus paper and whole lots of others (Becker, & Park, 2011). These materials should be provided in quantity and quality in laboratories and classroom to enhance teaching and learning. The inadequacy of these teaching and learning materials is argued as contributor to the challenge of teaching and learning of integrated science. Thus, notwithstanding the numerous benefits of integrated science education, teachers and students are bedeviled with some challenges which combat the effectiveness of studying the subject. This study seeks to explore the level of students' motivation and method of teachings and learning of the subject given these challenges. This would provide evidence in Ghanaian case. This canker also slows the effectiveness of teaching and learning of integrated science. The need to resolve these problems for the full realization of the benefits of integrated science education by both teachers and students in the selected senior high schools in the Cape Coast metropolis is the motivation factor behind this study

1.1. Objectives of the Study

The overall purpose of the study is to assess motivation and method of teaching and learning the integrated science in some selected senior high school in the Cape Coast metropolis. To achieve this broad objective, the study specifically seeks to

- Assess how students are motivated to study integrated sciencein
- Determine whether the teaching and learning environment is conducive for the study of the subject.
- Assess whether the methods used in teaching the subject promote effective teaching and learning.

2. Theoretical Literature

This study is guided by the assumptions of the socio cultural theory. Socio cultural theory is an emerging theory in psychology that looks at the important contributions that society makes to individual development. This theory stresses the interaction between developing people and the culture in which they live. This theory suggests that human learning is largely a social process (Mercer & Howe, 2012). One of the fundamental concepts of socio cultural theory, according to Lantolf, (2011) is its claim that the human mind is mediated. Lantolf claims that Vygotsky finds a significant role for what he calls tools in humans understanding of the world and of themselves. According to him, Vygot sky advocates that humans do not act directly on the physical world without the intermediary of tools from their environment.

Running a social commentary on how children then appropriate these cultural and social heritages, from parents and environments, Swain (2013) stated that the child acquires knowledge through contacts and interactions with people as the first step (inter-psychological plane), then later assimilates and internalizes this knowledge adding his personal value to it (intra-psychological plane). This transition from social to personal property according to Vygot sky who is the originator of the theory is not a mere copy, but a transformation of what had been learnt through interaction, into personal values. Swain (2013) therefore claims that this is what also happens in schools. Students do not merely copy teachers' capabilities; rather they transform what teachers offer them during the processes of appropriation.

Moreover, sociocultural theory has a holistic view about the act of learning. Lantolf and Beckett (2009) claim that the theory opposes the idea of the discrete teaching of skills and argues that meaning should constitute the central aspects of any unit of study. Any unit of study should be presented in all its complexity rather than skills and knowledge presented in isolation. The theory emphasizes the importance of what the learner brings to any learning situation as an active meaning-maker and problem-solver. It acknowledges the dynamic nature of the interplay between teachers, learners and tasks and provides a view of learning as arising from interactions with others.

According to Lantolf and Thorne (2015), sociocultural theory assumes that learning arises not through interaction but in interaction. Learners first succeed in performing a new task with the help of another person and then internalize this task so that they can perform it on their own. In this way, social interaction is advocated to mediate learning. The implication is that studying a subject such as integrated science should not be taught as an abstract subject, rather the method of teaching should be make the subject real. This following the theory could make the students internalize the process and subsequently operationalize the process independently. This means that that challenges in teaching and learning of integrated science could emerge when the practical elements are absent or limited in the teaching and learning process. According to Lantolf and Thorne, the theory goes further to say interactions that successfully mediate learning are those in which the learners scaffold the new tasks.

From the socio cultural theory, it could be observed that when students get help from among themselves and provide with meaning of what they learn through practical orientation, when tackling new tasks, they succeed. This thus indicates that the school environment when properly organised and method of teaching well chosen to enhance group interactions and open participation, students' appreciation of integrated science would be high. It is therefore necessary to gather data on how students are able to solve even complex tasks when put together.

The socio-cultural theory, has really explained in connection to this study, the relevance of teaching environment and teaching methods. The theory assumes that learning arises not through interaction but in interaction. Teaching and learning should seek to provide 'meaning' rather seeing as abstract. This would require practical orientation. This means that the method of teaching adopted by a teacher in a class has significant influence on the learning processes. When an

interactive method is adopted, the participatory atmosphere makes it easier for all students to easily grasp what is being taught. The proposition of the socio-cultural theory is not exclusive to interactive teaching but all other methods that makes the thought and intents of others disposable to all in attendance is very necessary.

2.1. Empirical Review

Focusing on teaching methods, Tilya and Mafumiko (2010) conducted a library based research on the compatibility between teaching methods and Competence Based Curriculum in Tanzanian Secondary Schools. The study explored how far teachers were faring with the implementation of Competence Based Curriculum. The results revealed that, teachers' practices in the classroom have generally remained traditional. The traditional teaching method referred to is the lecture method which most of the time is pre-occupied with teacher-talk-and-chalk while students listen and write. The findings also revealed that, the assessment of students' performance was still geared to pass examinations and not on assessing the level of competency attained by the students during their secondary education.

Similarly, Vuzo (2010), did a study on the problem of integrating visualised environment teaching strategies and the learning process in Tanzania secondary school classrooms. Her focus was on integrating visualised environment teaching strategies and the learning process using qualitative method. He found that, scarcity of media resources and practical environment was the chief cause of students' problems in the mastery of practical oriented subjects like geography and computer related programs as a subject and medium of instruction in Tanzania. She suggested that, educational planners should integrate quantitative and qualitative approach in planning for education. This integration will make sure that, optimal members of schools are constructed and all necessary resources for smooth teaching and learning are available.

Shirima (2013) conducted a research in Tanzania with respect to methods in teaching. The qualitative study was adopted to examine the effectiveness of Participatory Methods in Teaching of English subject in community secondary schools in the Moshi Rural District. Specifically, the study explored teaching methods being used in teaching of English subject, assessed the students' perceptions on the use of Participatory methods in teaching English subject, examined the challenges facing English teachers in using participatory methods to teach English subject.

The study findings revealed that teachers employ participatory techniques with little knowledge on how to practice them, most students have positive perception on the use of participatory methods but it was less practiced due to large class size and the fact that most had no mastery of English language. It could be noted that though the focus of the study was not about challenges, it presents a good methodology to follow. The mode of data collection is very vibrant and hence would be adopted in the current study. The challenges facing teacher in the English language as investigated is synonymous with that of those teaching integrated science hence lessons from this study serves as a guideline which is cautiously adopted in the current study.

Concentrating on E-learning of geography, Reddy and Beyene (2014) conducted a study of the challenges of teaching geography in Harari state in Ethiopia. From the study teachers and the students explained various challenges that limited them from practical and effective implementation of active learning in geography classrooms. The challenges they mentioned include large class size, lack of instructional materials and resources heavy teaching load of teachers, poor language proficiency of students low motivation and interest on teachers and students, shortage of class times for interaction and preparation meager, time allocation for coverage of the contents lack of experiences and prior knowledge and skills the teachers teaching style adopted and students learning style appropriateness of the curriculum materials and the exam stakes orientation and the classroom atmosphere and the sitting arrangements of the classroom. Geography is one of the practical oriented subjects; therefore, findings from this study are relevant in developing empirical comparisons. The finding from the study above is in line with the current study with respect to the various challenges identified. However, since the study by Reddy and Beyene (2014) was conducted in faraway Ethiopia, it is very necessary to investigate whether or not the same challenges hold in the Cape Coast metropolis with respect to integrated science

Studies conducted in different areas such as the Kumasi metropolis, Kitampo municipality and the Tamale metropolis depict the acute shortage of physical resources in secondary schools. For instance, in his study, Buabeng-Andoh (2012) revealed shortage of libraries, classrooms at Kumasi Anglican and Kumasi Wesley Grammar secondary schools in Kumasi metropolis. Bekoe and Eshun (2013) also reveals critical shortage of physical structures at numerous areas around the country, including schools in the Brong and Ahafo and the Northern region. The report by Buabeng-Andoh (2012) disclosed the shortages of classrooms, libraries and laboratory, at the Juabeng secondary school in Ashanti region. Perhaps, amazingly, it was found that due to shortage of physical resources, the office of the academic master was used as store. The study suggested that acute shortage of physical infrastructure such as laboratories and classrooms in secondary schools is an obstacle toward raising the quality of education for individual and national development at large.

2.2. Conceptualization of Teaching Methods

Teaching methods or instructional strategies are defined by Singh and Rana (2004) as something designed to establish interactions between the teacher, the student and the subject matter or a combination of these three to influence directly or indirectly, the learning process. For learning to take place, one must carefully plan procedures and activities that the students will undergo. This is achieved by varying behaviour, majoring the subject matter and teaching to meet the needs and interests of each individual.

Day (2012) suggests that the individual teacher must design and select methods in his instructions, and each design or selection should be based on his or her interpretation of what will constitute effective instruction for a particular population. Individual interpretation means lessons should be based on empirical evidence, past experience and extensive

knowledge of methods and materials. Given that the teacher is an authority figure and perceived of by the students as knowledgeable in the field he or she is teaching significantly influences the learning of the arts (McDonough & McDonough, 2014)

Buabeng-Andoh (2012) also believes that teaching goes beyond general skills, and must be geared towards the needs of a particular situation or the type of course, subject and level of the group or individual. Therefore, one cannot hold a teacher who uses methods and models of teaching that differ from the ones informed by research as necessarily a "bad teacher". Teachers and trainers need to be competent at employing the various methods of teaching. Tomlinson and McTighe (2006) support this by saying that teaching is an art and calls on its practitioners to work simultaneously in multiple media, with multiple elements. It is therefore necessary for one to select the best and appropriate method and strategy for a particular subject matter and student population, implying that teachers should vary their methods of teaching in order to suit the subject matter and the student at a particular stage. A critical evaluation of these submissions shows that teaching methods or strategies are important element of the learning process. The appropriateness of teaching and learning methods has implications on the performance of students on the subject. Integrated science like all the other science related subjects requires the teacher to use methods which could instil 'meaning' to the students and provide practical opportunities for these students to understand and appreciate the subject.

2.3. Concept of Students' Motivation to Learning Integrated Science

Learning is the process of acquiring and retaining knowledge, understanding, skills, capabilities and attitudes that cannot be attributed to inherited behaviour patterns or physical growth (Wagner, Garner & Kawulich, 2011). To Wagner et al, capacity for learning is innate and is based on psychological factors whiles rate of learning is based on both inherited and environmental factors. In contrasts to this assertion, Skinner (Day, 2012) opines that learning is seen as a series of experiences, each of which influences behaviour. Learning results should therefore be considered in terms of understanding the core processes within the content standards. Within this context of learning, various types are identified. Some of these types include affective, cognitive and psychomotor. The affective is that learning which has to do with feelings and values and therefore has influence on our attitude and personality. An example is being disciplined and courteous.

It has been argued that students' ability to learn and incorporate what they are taught is influenced by students' readiness and motivation (Lambert & Balderstone, 2012). Thus, students will to learn integrated science could be determined by the motivational factors within the teaching and learning environment. Students' motivation to learn integrated science depends on physical and mental maturation and also accumulation of experience as the basis for new learning. Students motivation to learning connotesthe readiness often shown by the student as evident in the eager response to learning tasks and is always accompanied by rapid progress. The lack of motivation may be due to lack of maturation or insufficient preparation in those foundations upon which new learning will be built. Though motivation to a large extent depends on the child himself, it is also the duty of the teacher to catch that aspect of the child for an efficient learning to take place.

3. Research Methods

The study was a descriptive survey. Descriptive survey offers the chance of gathering data from a relatively large number of cases at a particular time so as to make inferences and generalizations from the study of the sample. It is essentially cross-sectional (Angrist & Pischke, 2010; Creswell, 2013, Lewis, 2015; Maxwell, 2012).The population for the study was made up of Students and Tutors in the selected schools for the study. The study was conducted in the context of four(4) selected Senior High Schools located within the Cape Coast Metropolis. The total population was 128, made up of 120 form two integrated science students and 8 integrated scienceteachers. The targeted population was all integrated science students in the various schools but only form two's were accessible. The researchers chose form two students for the study on the basis that they had been exposed to enough topicsin integrated science and were also available to respond to the instruments. However, form one students were not used because they had reported to school not long ago and had barely completedintegrated science topics. Form three students, on the other hand, were at the time of data collection, busy with their mock examinations and so could not make time to respond to the instruments.

A questionnaire was designed for all respondents. The design was guided, to a large extent, by the material acquired from the literature review as well as the research questions. Items on the questionnaire were formulated using the research questions as a guide.The questionnaire comprised close-ended items. The respondents were provided with a four-point Likert-type scale made up of the following responses: Strongly Agree (SA), Agree (A), Disagree (DA) and Strongly Disagree (SD). They were asked to choose answers that appropriately represented their perceptions. The data collected were analysed using descriptive statistics

4. Results and Discussions

The results and discussions are presented based on the specific objectives outlined in the introductory section of this paper. These are assess how students are motivated to study integrated science; determine whether the teaching and learning environment is conducive for the study of the integrated science and assess whether the methods used in teaching integrated science promote effective teaching and learning.

4.1. Students' Motivation to Study Integrated Science

This objective sought to find out students' motivation to study integrated science. Table 1 reports the results of students' motivation to study integrated science. The level of motivation was assessed in terms of students' desire to attend integrated scienceclass; their willingness to undertake their integrated science assignment and how they enjoy integrated science lessons and participate in classroom.

Responds	Frequency	Percentage
Strongly Agree	13	10.83
Agree	19	15.83
Disagree	56	46.67
Strongly disagree	32	26.67
Total	120	100.0

Table 1: I Feel Good Going to Integrated Science Class
Source: Fieldwork, 2018

Table 1 illustrates that 26.66% of the student feel good going to integrated science class. This is represented in nominal terms by a total number of 32 students. This means that majority of the students have poor attitude towards the study of integrated science subject. This is not surprising since the subject is treated as compulsory at the senior high school level. Hence the students who go to the class may not have genuine interest in it. The implication is that students have not developed personal interest for the subject even though they have been compelled by the inherent structure of the Ghanaian educational system. The low desire of the students to go to the integrated science class shows low self-interest and this confirms Clark and Beck's (2010) assertion of the socio-cultural. The authors assert that if people take personal interest in the execution of a particular task, they always have a strong feeling towards that task that they have taken interest in.

Responds	Frequency	Percentage
Strongly Agree	30	25.00
Agree	39	32.50
Disagree	24	20.00
Strongly disagree	27	22.50
Total	120	100.0

Table 2: Willingness to Undertake Assignment
Source: Fieldwork, 2018

Table 2 sought to find out the willingness of students to do their take home assignment. The reason for the question is that, the willingness of the students undertakes their take home assignment illustrates some desire in or importance attached to the subject. The result indicates that a combine number of 69(57.50%) students either have relatively high desire to undertake their assignment or are willing to undertake their take home assignment. This is confirmed by the statistics reported in Table 2 about strongly agree and agree. This means that majority of the students are willing or have the desire to do their integrated science assignments. This sounding finding may be attributed to the fact that integrated science is a compulsory subjects and important requirement for the students to progress to tertiary institutions. Additionally, as practical based subjects, positive response to assignments is one of the sureties to achieve success and develop self-efficacy for the subject. Thus, the finding contributes to student self-efficacy. The tenet of the self - efficacy theory points to why most of the students are more willing to do their homework. It posit that in order to achieve high level of efficacy, people have strong influence on the approach to task, the persistence to accomplish same, as well as the level of effort applied to it (De Fátima Goulão, 2014). Hence since students of integrated science want to achieve higher laurels in future they tend to put in much effort like undertaking of their assignment. Thus, although they do not feel to go to class, due to the mandatory nature, they have to put out their best to excel.

Responds	Enjoy Lessons		Able to Participate	
	F	%	F	%
Strongly agree	20	16.67	35	29.17
Agree	36	30.00	38	31.67
Disagree	44	36.66	26	21.66
Strongly disagree	20	16.67	21	17.50

Table 3: How Students Enjoy Integrated Science Lessons and Their Participation in Class
Source: Fieldwork, 2018

From Table 3, it could be observed that majority of the students (64)do not enjoy integrated science lesson. This is substantiated by a combined percentage of 53.33% of strongly disagree and disagree. The implication is that although the students attend the integrated science class, they do not enjoy the lessons. Contrary to the results found for the level of

enjoying the class, majority of the students (73) representing 60.84% demonstrated that they do participate in the class. This illustrates that participation in class is very high.

Overall, the findings provide that majority of the students are not motivated by the teaching and learning of integrated science. These students generally do not have the desire and interest in the teaching and learning of the subject. Nevertheless, they prepare themselves to undertake assignments they are given and also participate in class. Thus, even though they do not have interest in the subject, they strive to develop self –efficacy for the subject as it is core to their academic progress. This affirms the contribution of Klassen and Chiu (2010) to the self-efficacy theory. Under this context, though students are satisfied with the subject, they have developed self-oriented opportunities for improvement and tend to work hard. They do not focus on their desire and interest but rather on what they can attain from participating in the learning processes.

4.2. Teaching Methods Used in the Teaching and Learning of Integrated Science

This question sought outlines the various teaching methods used to teach the students and how well the students are able the grasp the studies. It also explores the method that the student most adores which should have been employed.

Responds	Frequency	Percentage
Discussion	32	26.67
Note dictation	56	46.67
Lecture	24	20.00
Experiment	8	6.66
Total	120	100.0

Table 4: Teaching Method Most Used in Class
Source: Fieldwork, 2018

From Table 6, it is obvious that the most teaching method used in teaching the students is the note dictation. This method alone received endorsement by 56 of the respondents representing 46.67%. Nevertheless the second often used method of teaching is discussions. 32 of the students confirmed this with percentage of 26.67%. However, the number of students who cited lecture as method of teaching was no mere a number. This also means that comparatively, note dictation and lecture take high stage in the teaching and learning of integrated science. Surprisingly the experimental method of teaching was the last in terms of usage. Only 8 students confirmed the use of this method representing 6.66%.

The results explain why majority of the students do not have desire and interest in the teaching and learning of integrated science. When asked why the students are not motivated or do not have interest and desire in the learning of integrated science, a considerable number of them stated that they find it difficult to understand some words and concepts of the subject. It could thus be deduced that, students' inability to understand the words and concepts used is due to the note dictation and lecture method employed by the teachers.

The deficiency in the note dictation method is supported by Tilya and Mafumiko (2010) in their study of best methods for competency in curriculum. They indicated that the traditional teaching method which is pre-occupied with teacher-talk-and-chalk while students listen and write makes it difficult for student to understand the whole concept. Tilya and Mafumiko further revealed that such method result in students focusing their attention to pass examinations and not on assessing the level of competency attained by the students during their secondary education. This also echoes why students concentrate on doing their assignment and pay attention to class participation without developing sense of attachment to and interest in the subject.

Responds	Frequency	Percentage
Discussion	43	35.83
Note dictation	15	12.50
Lecture	3	2.50
Experiment	59	49.17
Total	120	100.0

Table 5: The Teaching Method That Students Most Prefer
Source: Fieldwork, 2018

The information in Table 5 confirms the information in Table 1 (assessment of students' motivation to teaching and learning). In Table 1, it was revealed that most of the students do not enjoy going tointegrated science lessons as well as they do not enjoy the class. There is no interest and actuality balance. From table 4, it was also observed that the most used method in teaching integrated science is the note dictation method which according to Table 5 is the least preferred method by students apart from the lecture. Hence, there is little wonder that the students have low motivation or interest in the learning of integrated science.

This confirms the socio cultural theory's assumption that learning arises not through interaction but in interaction (Lantolf, 2011). The theory illustrated that the method of teaching adopted by a teacher in a class has significant influence on the learning processes. When an interactive method is adopted, the participatory atmosphere makes it easier for all students to easily grasp what is being taught (Mercer & Howe, 2012). Moreover, the findings confirm the study by Shirima

(2013) which sought to examine the effectiveness of Participatory Methods in Teaching of English subject in community secondary schools in the Moshi Rural District. The study findings revealed that teachers employ participatory techniques with little knowledge on how to practice them, most students have positive perception on the use of participatory methods but it was less practiced due to large class size and the fact that most had no mastery of English language.

To be more conclusive about the method of teaching and learning, data were also sought from teachers. They were to provide methods they employed for the teaching of integrated science. The findings are reported in Table 6.

Response	Frequency	Percent
Discussion	4	50.00
Note Dictation	3	37.50
Lecture	0	0.00
Experiment	1	12.50
Total	8	100.0

Table 6: The Most Adopted and Usually Used Teaching Method
Source: Fieldwork, 2018

It could be learnt from Table 6 that although the teachers provided that discussion is the main method of teaching, note dictation is about 37.50%. Thus, there is no much difference about thedata on method of teaching provided by the students and the teachers.

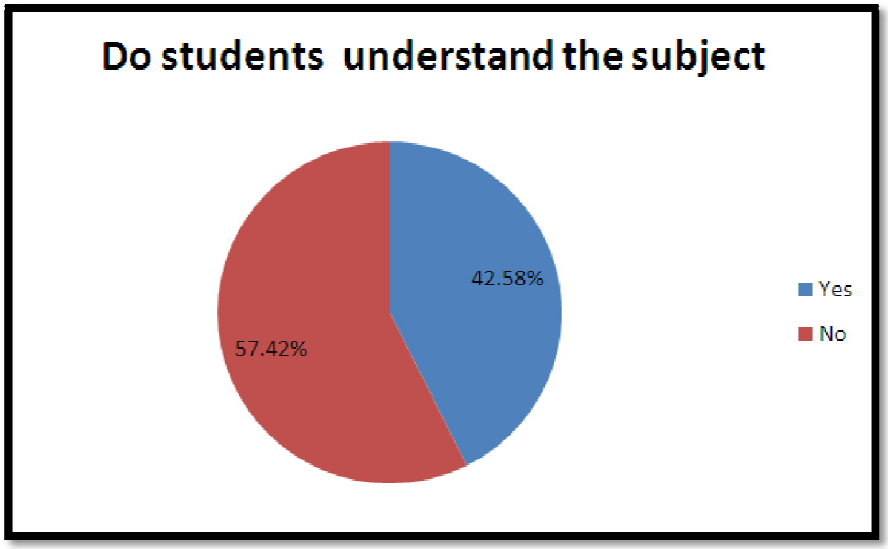

Figure 1: Do Students Understand The Method Used In Teaching?
Source: Field Work (2018)

The results from Figure 1indicate that, the students' really do not understand the subject. Only 42.58% appreciate and understand integrated science. This is consistent with the results found under the motivations. The weakness in performance or understanding could be explained by the lack of interest the students have for the method of teaching.

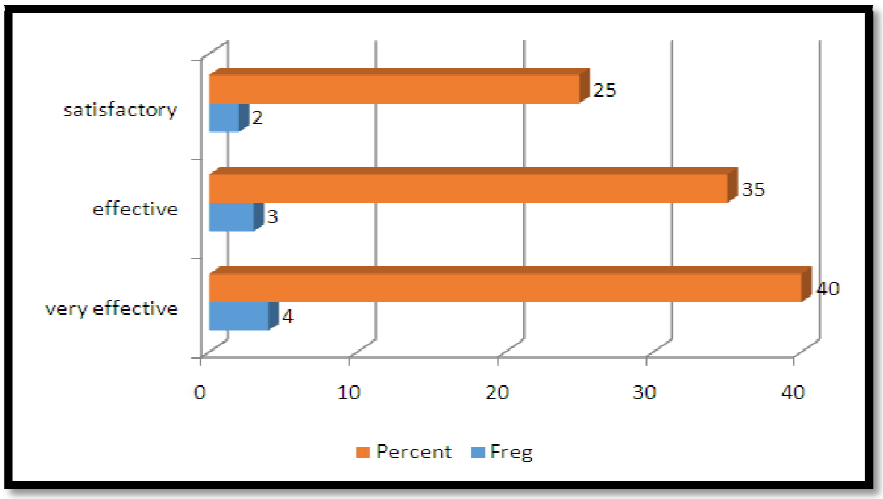

Figure 2: How Effective Do Students Respond to Method Used?
Source: Field Work (2018)

The figure above demonstrates that from the perspective of the teachers, the students respond to the teaching method effectively. This is substantiated by the 40% of the number of teachers who were drawn for the study. This finding seems to contradict the position of the students. The possible cause of the contradiction may be attributed to the fact that students do not have the confidence to question their teacher's method of teachings. In fact this reflects Ghanaian traditions and culture. Ghanaian culture does not encourage the young ones to stand up against the elders let alone their teachers. Another contributing factor may be how well the students themselves strive to participate in the class even though they do not have interest and desire in the mode of delivery. Summarizing the various teaching methods and how they aid in the teaching and learning of integrated science, it could be stated that, the most adopted method is the discussion method which seems to be in the interest of the students. Moreover, note taking also features sometimes and this method significantly affects the students' understanding of some critical concept of the subject. Furthermore, it has been revealed that the students are to privy to experimental learning to boost their knowledge practically on the subject.

4.3. Environment for Teaching and Learning Integrated Science

As discussed in the theoretical literature, environment is an important element of teaching and learning. The third and final objective of the paper sought to assess the environment for teaching and learning integrated science. This objective explores whether or not students have the required materials and enabling environment for the study of integrated science. The results are presented in Tables 7 to 9 and other relevant figures.

Response	Frequency	Percent
Yes	57	47.50
No	63	53.00
Total	120	100

Table 7: Sufficient Room Space for the Study of Integrated Science
Source: Fieldwork, 2018

Table 7 shows that reasonable number of the respondents (57) have enough room space for the study of integrated science, though the number is still less than 50%. This is because 47.50% of the respondents indicated that they have enough room space for the study of the subject. This is reasonable though less than majority because with the current Free SHS policy, there is infrastructure challenge. Similarly, such information is in the same direction with that of the teachers. The teachers indicated that the find themselves in a classroom environment where the students are not overcrowded. This could be seen from Table 8.

Response	**Frequency**	**Percent**
Strongly agree	4	50.00
Agree	1	12.50
Disagree	3	37.50
Total	8	100.0

Table 8: Enough Space to Teach Integrated Science
Source: Fieldwork, 2018

From Table 8, it could be observed that combined total of 5 out of the 8 teachers indicate that the have enough classroom space to teach and that the students are not overcrowded. This represents a total of 62.50% of the respondents.

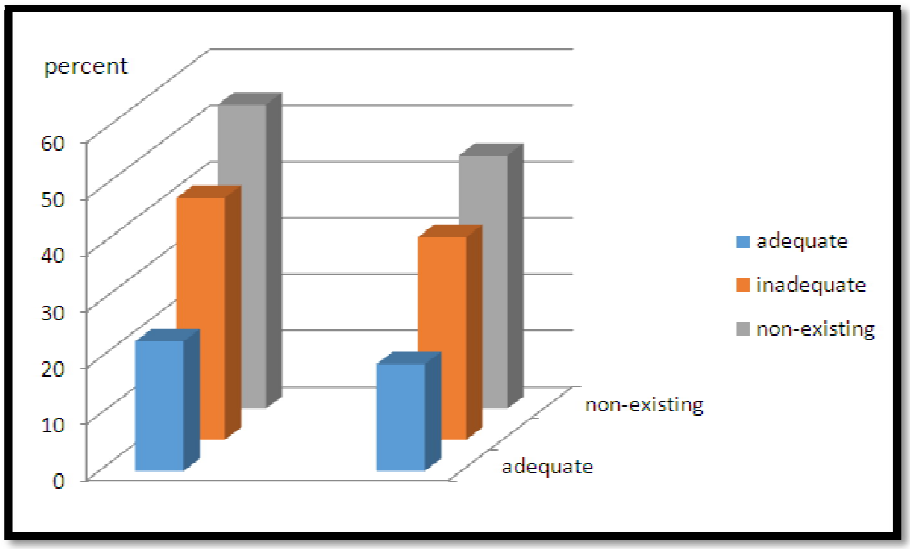

Figure 3: Condition for the Supply of Books
Source: Field Work, 2018

The Figure 3 explains the condition of book supply for the study of integrated science. The books in question include textbooks, and other learning materials like graph books. The result shows that the supply of such books is practically non-existing. Those who indicated the existence of such books also noted that they are not adequate in number. This however, slows the pace with which students learn the subject.

4.4. Availability of Study Materials in the Classrooms

This question seeks to examine the atmosphere of the environment within which the students study in terms of materials. It explains students' responds to the availability of materials which helps students in the teaching and learning of integrated science

Responds	Frequency	Percentage
Strongly Agree	10	8.0
Agree	20	15.0
Disagree	32	28.0
Strongly disagree	58	50.0
Total	120	100.0

Table 9: Availability of Laboratories
Source: Fieldwork, 2018

Responds	Frequency	Percentage
Strongly Agree	5	4.0
Agree	15	14.0
Disagree	48	40.0
Strongly disagree	50	42.0
Total	120	100.0

Table 10: Availability Enough Practical Materials and Other Apparatus
Source: Fieldwork, 2018

Responds	Frequency	Percentage
Strongly Agree	4	3.33
Agree	13	10.83
Disagree	33	27.50
Strongly disagree	70	58.34
Total	120	100.0

Table 11: Availabilityof Computers and Projectors
Source: Fieldwork, 2018

Table 9 and its subsidiaries (a, b, and c) illustrates that there is a big deficiency in the availability of materials in the classrooms for the study of integrated science. From the table it could be observed that materials like computers and projectors are virtually non-existing at all in the classroom. This might have played down the students' interest and desire. Computers and projectors help in the visualization of the scientific concepts. This assertion is supported by Vuzo (2010) who indicated that the presence of visualised materials is very necessary for teaching and learning. Furthermore, it could be realised from the table that tools like laboratories and practical materials and tools are inadequate in the classrooms of the students. This makes it very difficult to tackle the practical aspect of integrated science. This explains why the teachers have attached less attention to experiment as method of teaching. These deficiencies do not motivate the students in appreciating the subjects.The unavailability of these materials confirms the study by Reddy and Beyene (2014) in Ethiopia which revealed large class size, lack of instructional materials and resources, heavy teaching load of teachers as major challenges which could undermine the teaching and learning.

Additional studies by Buabeng-Andoh (2012) as well as Bekoe and Eshun (2013) reveal that the unavailability of physical resources is the major challenge of teaching and learning in Ghana. This information from the table above confirms such findings as most essential resources for the study of integrated science have been found to be inadequate.

5. Conclusions and Recommendations

The study sought to explore the level of students' motivation (interest and desire) and teaching methods for teaching and learning of integrated science. Three main objectives were formulated to guide the study:assess how students are motivated to study integrated science; determine whether the teaching and learning environment is conducive for the study of the integrated science and assess whether the methods used in teaching integrated science promote effective teaching and learning. It was found that students' motivation for teaching and learning of integrated science was relatively low. Although the students have the will to respond to integrated science assignment and desire to participate in class discussions, the interest and desire for the subject is low.

The nature of the subject as core subject was seen as a compelling force for them to embrace the subject. It also emerged that the teaching methods which are dominant in the teaching of integrated science is note dictation and somewhat

discussions. Little emphasis is placed on experiment in the teaching and learning even though the subject is practical oriented subject. The students generally showed that their preferred method of teaching is experimental teaching and learning contrary to what is actually happening in their class room. These findings explain why these students do not have interest and desire in the subject. Thus, there is teaching and learning imbalances in terms of methods. The study concluded that the teaching and learning environment is also challenging. Laboratories and practical materials are virtually absent. This discouraged the use of experimental method of teaching. It is suggested that government and parent teacher's association (PTA) should jointly contribute to resource science centres to boost students desire and interest in science. As short term measure, teachers are encouraged to vary their method of teaching and skew to discussions especially in an environment where the laboratory is not available for experiment. Visual aids and other computer imaging could be introduced to supplement the absence of fully equipped science resource centres. These could motivate students to marry the study of integrated science.

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