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research practice and policy in education

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## Editorial

The journal of Educational Development and Practice, (JED-P) is a journal of the Institute of Education, University of Cape Coast, Ghana. The journal focuses on contemporary issues in educational development in Ghana and other countries, particularly, in the context of a developing world. Because the Journal also seeks to stimulate extensive dialogue and discussion on educational policy and practice articles that feature on the following issues are welcome: (a) Review of curriculum practice, (b) Evaluation of educational policies, (c) Critique of basic, secondary and teacher education policies and practices, (d) Evaluation of various educational programmes such as interventions by NGOs and governmental agencies, and (e) studies examining alternative models of educational delivery.

The journal carries empirical and theoretical studies and targets local and international audience. Important criteria in the selection of articles for publication are: quality of presentation, conviction in argument, clarity in presentation and educational significance. It is published once in a year. January to February is the period for receiving articles and December is when the journal is published. This second edition has articles of educational significance.

In the first article, the author gives insight into science practical activities in senior secondary schools in Ghana. He prescribes the kind of science practical work that students should engage in given the conditions in the schools and the demands of the practical examination.

Senior secondary school students' ability to interpret biological diagrams is the focus of the second article.

Is there a relationship between study habits and academic performance? This is the question that the third article answers with respect to distance learners of the University of Cape Coast.

After observing students during lessons, the author of the fourth article brings out the interactions that go on in the classroom during academic work.

The author of another article describes how out-of-school literacies can be made part of the school curriculum after giving a historical account of the definition of literacy.

Insight into how socio-economic and prestige factors affect the career aspirations of secondary school students in Ghana is given in the sixth article.

The role peer observation and intervention play in the effectiveness of teachers at the Ho polytechnic is brought to light in the seventh article.

In the eighth article, how a teacher is utilized in the training college is investigated using tutors from the Volta region of Ghana.

How willing basic school teachers are in returning to the basic schools after upgrading themselves professionally forms the basis for the last but one article.

The next paper establishes whether there is a relationship between the attitude of teachers to mathematics and the teaching of mathematics.

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## **The State of Science Practical Work in some Ghanaian Senior Secondary Schools**

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### **Abstract**

The study investigated how schools organise science practical activities for students, and the constraints under which they were organised. Completed questionnaires were received from 50 science teachers in 9 out of the 18 senior secondary schools in the Central Region of Ghana offering elective science subjects. Twenty students and Heads of Science Departments were also interviewed in four case study schools. The information obtained suggests that there are inadequate exposure of students to laboratory training and practice in the schools as a result of time constraints, overloaded curricula and inadequate equipment. Hence West African Examinations Council must emphasise science process skills which do not require extensive use of the laboratory with its attendant constraints.

The literature on science practical activities shows that laboratories for the conduct of scientific research have existed at least since the seventeenth century. However, according to Jenkins (1998), the use of the science teaching laboratory, designed and equipped to teach science to students, is essentially a nineteenth-century phenomenon. The world war I in 1914-1918 opened the eyes of people to the importance of science teaching, and so since the beginning of the 20<sup>th</sup> Century, there has been continuous increase in facilities and equipment suitable for practical science teaching. Currently, science practical activity has become an integral part of most new science programmes in developing countries Lockard cited in Lewin (1992).

The science syllabuses for Ghanaian Senior Secondary Schools (SSS) issued by the Ministry of Education (1990) and the West African Examinations Council (WAEC, 1998) have practical activity components to be conducted in a laboratory setting. The Curriculum Research and Development Division (CRDD) document is a teaching syllabus whilst the WAEC document is an examination syllabus. The WAEC syllabus from 1998 to 2000 for example, emphasizes students' acquisition of practical skills in biology, physics, and chemistry. For biology, students are expected to acquire (a) adequate laboratory and field skills in order to carry out and evaluate experiments and projects in biology and (b) the necessary scientific skills for example, observing, classifying and interpreting biological data.

For physics students are to (a) carry out experimental procedures using apparatus; (b) develop abilities, attitudes and skills that encourage efficient and safe practice; and (c) make and record observations, measurements and estimates with due regard to precision, accuracy and units. In chemistry the purpose of practical activity is to enable students (a) develop laboratory skills, including an awareness of hazards in the laboratory and the safety measures required to prevent them; (b) appreciate the scientific method which involves experimentation, accurate observation, recording, deduction and interpretation of scientific data.

To achieve some of these objectives, students must of necessity use the conventional approach of doing science in a laboratory. According to Osborne (1998), this kind of emphasis on laboratory work is "strongly associated with the conception that scientific knowledge is lying around out there to be discovered by the curious" (p. 171). This idea of tying science education to the laboratory has been the practice and culture of science teaching and learning since the nineteenth century (Hodson, 1990). It is therefore not surprising that the WAEC and CRDD syllabuses place emphasis on the manipulation of standard apparatus, the gathering of experimental data and the acquisition of laboratory skills. However, some of these skills are not tested directly by WAEC in a practical examination at the Senior Secondary School Certificate Examination (SSSCE).

Since the SSS science syllabuses (WAEC and CRDD) emphasize the acquisition of scientific skills, it is expected that students would go through the science practical activities to acquire the necessary skills and prepare for the final WAEC science practical examinations. With the provision of Science Resource Centres (SRCs) by the Ministry of Education (MOE), it is also expected that schools which do not have enough apparatus would have the opportunity to undertake more practical activities.

However, a variety of specific students' weaknesses in the science practical examinations have been reported by Chief Examiners over the past five years and this has cast serious doubts on SSS students' involvement in science practical activities in schools. The following are some of the persistent weaknesses which have been identified over the past seven years by Chief Examiners (WAEC Chief Examiners' report, 1995, 1996, 1999, 2000, 2001):

1. candidates have not been having adequate practical activities was shown by the answers provided;

2. it was clear from the answers that some candidates had not done any experiments along the lines tested at all;
3. candidates generally made statements of facts which clearly demonstrates that the suggested activities in the syllabus are not being carried out with any seriousness
4. most candidates did not show any sign of having done a simple recrystallisation in their lives;
5. candidates were incapable of critical analysis and interpretation of biological data.

These reports give the impression that students are either not taken through practical activities or do not take them seriously. The purpose of this study was therefore to find out how schools organise science practical activities, and also whether there were constraints under which they were done.

### Participants

The Central Region had 49 SSS, with 18 of them offering all three elective science subjects (physics, chemistry and biology) at the time of this study. Of the 18 schools, 11 were SRC schools with the remaining seven constituting satellite schools. The schools categorized as SRC schools were locations, which hosted the SRCs. The satellite schools were schools which went to the SRCs for some of their science practical activities. Each school was assigned an identification number and proportionate simple random sampling was used to select four satellite schools and five SRC schools yielding a total of nine schools.

Fifty science teachers who were at post at the time of the research completed and returned their questionnaires. These were made up of 30 teachers from SRC schools and 20 from satellite schools. Four case-study schools were purposively selected from nine schools in order to gain more insight into teachers' views about science practical activities that emerged from the survey. Factors such as proximity and time constraints influenced the choice of schools. The four schools were named X, Y, W and Z. Schools X and Y had SRCs whilst schools W and Z were satellite schools.

In each of the four case study schools, four to six science students (depending on the number of streams in the school) were selected for focus

group interview. Focus groups in each school were made up of the class prefect, assistant class prefect and two to four other students selected through simple random sampling. Schools W and X were categorised by the Ghana Education Service (GES) in the Central Region as well-endowed schools, whilst schools Y and Z were considered to be poorly endowed.

### Instruments

The Questionnaire on the Organisation of Science Practical Work (QOSP) was designed after small-scale investigations on how science practical lessons were organised in three SSS in the Cape Coast Municipality. Discussions between me and nine science teachers (one each in biology, chemistry and physics) in the three schools who had been organising practical activities in their schools enabled me to formulate the questions for the QOSP. This also ensured that major areas of concern to teachers on the organization of science practical work were addressed in the formulation of the questions. The formulated questions were pre-tested in two schools (an SRC school and one of its Satellite schools in the Central Region) with the aim of ensuring that the QOSP fairly and comprehensively covered the items on science practical activities in the schools. The responses of the teachers were used to improve the questions. The questionnaire was validated by two experienced science educators in the Department of Science Education, at the University of Cape Coast. The final questionnaire used for the study had several parts. These included sections on biographical information (e.g. teaching experience, subject(s) taught at the SSS level), organisation of science practical activities (e.g. support given to students, number of times practical work was done on the average each week).

Semi-structured interview protocols were used to collect data from students and Heads of Science Departments (HODs) in the four case study schools. The semi-structured approach to interviewing was used, mainly to gather descriptive data in the subjects' own words to confirm or refute findings from the teachers' questionnaire. Since the study was based on a multi-site case study approach, it was necessary to ensure that data collected was of a comparable nature across interview subjects. Semi-structured interview schedules were therefore prepared for each category of respondents so that key issues were not overlooked and that similar agenda were covered in the interviews. This format also helped to raise issues of

particular concern to the study. The interview schedules served as a guide so that interviews could proceed as naturally as possible.

### **Methods**

I administered the QOSP with the assistance of Heads of Science Departments in the nine selected schools. Questionnaires were distributed to 60 science teachers of which 50 were returned. As much as possible, all questionnaires administered were collected by the third day. Expected respondents were reminded thrice after which they were abandoned if they had not still responded. This procedure resulted in an 83% return rate.

All interviewees were given assurances of confidentiality and anonymity at the beginning of each interview session. Students' interviews took place in a quiet and comfortable environment with little possibility of distraction or intrusion, so that students could talk freely. All interviews conducted in the study were recorded using an audio tape-recorder supplemented by note-taking with the permission of the interviewees. The Heads of Science Departments of the four selected schools were also interviewed. The purpose of the interview was to seek deeper insights into issues, which emerged from teachers' questionnaire and students' interviews. To ensure consistency and preserve the validity of the study, similar data collection techniques were used in all the four case study sites. In each of the four schools, focus group interviews were conducted with four to six science students (depending on the number of streams in the school).

The physics, chemistry and biology practical write-ups of all 20 students who took part in the interview sessions were examined to find out the type of practical activities they had undertaken, their frequency and their relationship to the science syllabuses.

The teachers' questionnaire was analysed using percentages of responses to the questions asked. Data gathered during interviews were analysed by reducing them to categories and themes, and interpreted to provide insights into laboratory science practical activities. All the interviews were transcribed. Even though this was time consuming, it helped to create familiarity with the data and hence aided the process of analysis.

## **Results and Discussion**

### **Performance of science practical activities**

A look through students' science practical notebooks in all four case study schools and subsequent interviews with them revealed that much attention was not paid to practical work in physics, chemistry and biology in the first two years of science teaching. It was not possible to ascertain the number of practical activities performed by science students just by looking at the records in their science practical notebooks. This is because in all the case study schools, students did not keep proper records of practical work done. It came to light during interview with students that data collected during practical activities were sometimes not recorded into their practical notebooks, or when recorded, no final write-ups were done. Also, students were allowed by their teachers to use pieces of paper to record and write up practical work they had done. Some of the few practical exercises that had been marked did not show dates and/or titles of the practical activities. The impression from students' practical notebooks was that teachers and students did not pay much attention to the write-ups and marking of practical work.

Table 1 shows the number of practical activities performed by students over a period of two and a half years at the time of this study (students' interviews were conducted in the last half of the third term of the academic year). What appear in Table 1 are the number of practical activities recorded in notebooks, pieces of paper. Zero means students did not perform any practical activities during that year. It can be seen from Table 1 that generally, students in SRC schools performed more practical activities than their counterparts in satellite schools. This is to be expected as SRCs have relatively better equipped laboratories for practical activities than satellite schools.

Table 1: Number of practical activities performed and recorded in physics, chemistry and biology by two school types

School/Subject		Number of practical activities per class			
		SSS1	SSS2	SSS3	Total
Physics					
W*	SAT	1	0	10	11
X*	SRC	2	5	6	13
Y	SRC	4	0	5	9
Z	SAT	1	0	2	3
Chemistry					
W*	SAT	1	0	9	10
X*	SRC	5	5	6	16
Y	SRC	0	2	6	8
Z	SAT	0	6	4	10
Biology					
W*	SAT	1	0	0	1
X*	SRC	3	5	5	13
Y	SRC	2	5	14	21
Z	SAT	0	0	10	10

\*In the case of schools W and X with more than one stream, the number of practical activities recorded in the table is the highest among the streams. A look at students' practical notebooks revealed that generally, over half the number of practical activities was not marked. The picture portrayed is that students performed very few practical activities during the first two years in the case study schools. As students in schools X and W put it

In this school, we normally suspend the practical to SSS2 third term and SSS3. So in SSS1 and SSS2 we seldom do experiments. So we didn't do a lot of practical...the teacher was saying that because of our number we can't be doing practical with the SSS2 and the SSS3 students when we were in SSS1. At least we've got more time so our practical work could be suspended for some time so that when we get to SSS3 we will do more practicals (Student, School X).



We were not going to the lab very often to do practical. Some of the students and the teachers did not take the practical classes seriously. Most of us thought that since we were in SSS2 maybe there was more time ahead so it is actually in SSS3 that we started practical so we didn't take the practical seriously from the beginning (Student, School W).

Since students had to be prepared for the WAEC practical examinations at the end of the third year, it was not surprising that more practical activities were done during the third year. Thus Table 1 shows that in all the schools except school X, students did not perform any physics and chemistry practical activities in SSS2. At least school Y could not complain about lack of apparatus, because it had an SRC. Students in schools Y and Z did not also perform any chemistry practical activities in SSS1. Also there were virtually no biology practical activities for students in school W. The situation in biology was not different in school Z in SSS1 and SSS2, except that the teachers decided to make up for practical work not done by doing more practical activities (10) with their students in SSS3. The situation for physics practical work in school Z was the worst.

According to students in school Z, when they were in SSS1, they performed only one physics practical activity which was on "Finding the refractive index of a glass block". Their notebooks confirmed this but they could not even complete this practical activity. In SSS2, they did not perform any practical activities in physics at all. In fact, at the time of this study, the students who were then in SSS3 had performed only two practical activities in Physics. The second practical activity conducted in SSS3 was done in the second term of the academic year. This was on the "Determination of the refractive index of glass using illuminated objects" as indicated in their notebooks. This was marked by the teacher and discussed with the students. Both practical activities done in SSS3 were on light experiments leaving experiments on mechanics, electricity, heat, and sound undone at the time of the study. According to the students, the first experiment in mechanics they performed took place during the mock practical examination in the third term of the academic year in SSS3. Speaking on behalf of her colleagues, a student in school Z remarked:

The teacher told us to go and read about it. So we read about it and came to apply it in the examination. Some were able to take the readings

and tabulate the results but how to come out with the graph was difficult. So we couldn't plot the graphs. Another problem we got was that as we swing the pendulum we wasted more time on it so some of us couldn't finish the experiment. (Student, School Z).

In the mock examination, students were asked to measure the diameter of a pendulum bob but they were not provided with vernier callipers because they were not available. The account of one of the students on how he tackled the measurement of the diameter of the pendulum bob is quite revealing:

I have not seen vernier callipers before...I don't know whether we had it. I didn't do the measurement (Student, School Z).

The case study also produced comments from students which seem to suggest that end-of-term science practical examinations were rarely conducted by the schools either at the end of the term or year. Apart from school Y where students said they took an End-of-Term Practical Examination on two occasions, none of the other three schools organized any science practical examinations apart from the mock practical examination in SSS3. Some comments from students attest to this.

The mock examination was the first practical examination we took (Student, School Z).

Our first practical exam was the mock exam in April. This was the second term in the third year. In SSS2 we were told that we will do practical exams but they kept postponing it (Student, School X). Here we only have practical exams during mock, because the mock is supposed to be like the final exam (Student, School W).

The lack of practical activities in school Z, being a poorly resourced school, may seem to be an extreme case, but it was not very different from School W, which in comparison was better equipped. Table 1 shows that in a whole year in school W, there was only one practical activity each in physics, chemistry and biology in SSS1. According to the students, the

chemistry practical activity in SSS1 was based on a past WAEC practical examination question, but they could not make much of it at that time. One student remarked:

I remember our chemistry teacher gave us the question but he didn't show us anything about it. He just gave us the practical question to do. (Student, School W).

The only physics practical performed by students of school W in SSS1 was on finding the "Density of an irregular object". Again a student remarked:

He showed us how to do the practical, and we wrote the instructions in our notebooks. We did the practical, but we didn't write it up for him to mark (Student, School W).

Students in school Y (SRC school) who had done relatively more practical work than those in school Z (satellite school) were worried that even though they had done more experiments in SSS3 than in SSS1 and SSS2 combined, they still had a lot more practical activities to do in order to gain enough experience and have better confidence before the final WAEC practical examination.

Teachers were asked in the teachers' questionnaire to indicate whether students were able to complete laboratory work and the subsequent write up within the period allocated for science practical. The responses are presented in Table 2. It can be seen from Table 2 that only one-half of the teachers (52.0%) indicated that students normally completed their laboratory work and write-up within the time allocated for practical activities. This ranges between 45 minutes to two hours. From Table 2, 88.0% of the teachers indicated that more often than not, students only completed the laboratory work. This means that the write up of the practical work had to be pushed to "after school" as data collection dominated the practical time.

Table 2: Percentage teachers' responses in each category on completion of laboratory work and write-up (N=50)

Items	Always	Very Often	Often	Never/Rarely
Students complete their lab work and write up	8.0	14.0	30.0	48.0
Students complete only lab work	20.0	50.0	18.0	12.0
Students do not complete lab work	0	4.0	12.0	84.0

Even though the emphasis on collecting data provides perspective and context for the students according to Wardle (1998), it is the ability to interpret and reason, which are higher order skills in science, that develop the understanding of the concepts and procedures involved. It is therefore clearly invalid and unconvincing in terms of developing students' understanding of science for them to just collect data in the name of carrying out practical work without allowing them to question, reason and draw conclusions from the data collected. It seems the main concern was for students to go through the practical activity and take some readings. What students did with the results and graphs plotted seemed not to be very important. This seems to be a common practice in all the four case study schools. Driver as cited in Wardle (1998) rightly reflected on this common approach to practical work when he stated that:

Practical lessons end abruptly when the prescribed task is complete and little, if any, time is given to the interpretation of the results obtained, although this is just as important as the activity itself (p. 272).

As one student in school X put it:

When we do the practical, the main concern is just how to get the values. That is the main thing we do towards the SSSCE. So in many cases we don't do a complete write-up. So far as we get our values and plot our graphs, we are okay. The main thing they are concerned with is the graph or how we get the table. So we don't normally write up the practical systematically (Student, School X).

According to the students in school Z, the lack of a biology teacher accounted for their not performing any biology practical activities in SSS1. But the same cannot be said for the lack of physics practical activities in the same school in SSS1. The students had a physics teacher, but he did not conduct any practical sessions with them. Similarly, the other schools had teachers but practical sessions for students were scanty. In school W, the HOD agreed to the observation that emphasis was not put on science practical work for SSS1 students. He however, defended this practice by saying:

We have a reason for that. The time table doesn't cater for science practical work. We have six periods for physics, and within those six periods, which is two periods a day, you cannot organize science practical. So it is not the fault of the teachers that the students do not do physics practical. At the same time if you look at the syllabus there are so many things to cover, and so you have to rush. So you are forced to cover most of the syllabus in the lower forms and later towards SSS3 then you do science practical with the students  
(HOD, School W).

According to the HOD, an attempt was always made in the final year to make up somehow, for practical work neglected the first two years, so that at least students would be able to take the WAEC science practical examinations. It is therefore fair to conclude from the multi-site case study evidence, that emphasis was not placed on the performance of science practical work in schools, especially in the first two years.

The nature of the questions in the WAEC practical examination seems to promote this lack of emphasis on regular practical work according to the HODs. One HOD indicated that some areas in the WAEC Biology practical examination for example, could be handled by students once they were conversant with the theory aspect. The WAEC biology practical examination is made up of the following five areas: (a) graphs (drawing and interpretation) (b) classification (c) identification of specimen (d) description of experiments (supposed to have been conducted by students) and (e) drawing of specimen. According to the HODs and students interviewed, (a) to (c) constitute techniques which are taught with virtually

no practical activities. According to the HODs it is only (d) and (c) that students needed to have some practice, to be able to describe or draw during the practical examination. If this is the case, then it means some of the practical activities relevant to the WAEC biology practical examination do not relate strictly to laboratory tasks but to general cognitive competencies. Since teachers seem to be aware of this, they do not put so much emphasis on practical activities in all five areas. Fortunately for teachers and students, in physics and chemistry, practical work constitutes only 20% of the total score, and so poor performance in the practical examination may not adversely affect students' final grades; provided they perform very well in the theory papers. In biology, practical work takes up almost a third (30%) of the total marks for the biology examination. Students' performance in biology is therefore more likely to be affected by poor performance in biology practical activities compared to physics and chemistry. However, if the claim by HODs that a sizeable amount of the biology practical examination could be handled by students without necessarily going through practical work, then the lack of practical work may also not adversely affect students who have mastered the theory work in biology and could handle (a) to (c).

One way of reducing frustration on the part of students during science practical work is supporting them before and during practical activities. In the teachers' questionnaire and during focus group interviews, teachers and students were asked to indicate the kind of support they received and the source of that support. About 42.0% of science teachers indicated that they and their laboratory assistants gave support to students whilst 20.0% of the teachers indicated that students received support from only science teachers. Another 22.0% indicated that students received support from science teachers, laboratory assistants and their fellow students. Asked to state who students received most support from, 76.0% of the teachers stated that they provided the most support to students.

The survey of teachers' views in the nine schools shows that 76% indicated that they conducted pre-laboratory discussions with their students whilst 24% did not do so. Case study evidence shows that pre-laboratory discussion in the schools depended on which teacher was involved. In some schools, teachers organised pre-laboratory discussions whilst others did not. Also, teachers sometimes organised pre-laboratory sessions on some occasions but did not do so on other occasions. There was therefore no standard practice across the schools on the organisation of pre-laboratory

sessions for practical activities. According to Hodson (1993) the “only effective way to learn to do science is by doing science, alongside a skilled and experienced practitioner who can provide on-the-job-support” (p. 120). Responses to the teachers’ questionnaire show that all the teachers indicated that they give support to their students during science practical activities. However, the evidence from the case study schools shows that professional support for students differed from one science subject to another, and also from one school to another. In fact, in some cases, students indicated that no support at all was given to them contrary to the responses given by the teachers. When students were asked how helpful their teachers were when it came to practical work, and whether their teachers were always present to give them support, those in school Z, for example, indicated that they did not receive much support during practical activities in physics. In biology and chemistry however, their teachers together with laboratory assistants, and their own colleagues gave them a lot of support. Students in school W also indicated that they received a lot of support from their chemistry teachers but not from their physics teachers. The following comments from different schools express students’ views on support given by teachers during practical work.

In chemistry the teacher will explain everything to us and give us an example, and set up the apparatus for us to do. When we have any problems the teacher is there to help us (Student, School Z).

For the few physics practical we have done the teacher was very helpful. He went round and showed us how to do things. But for chemistry, he just gives us the apparatus and expects us to be able to go through and later we discuss (Student, School X).

In my class the science teachers are not too helpful, whether physics, chemistry or biology. Even though they are always present when we do our practical they do not come to see what we are doing (Student, School W).

Students cherished support from their fellow students as the following quotations from students show:

When you can't do an experiment and you see that someone has been able to do it you call him to come and help you. The teacher would still be in the laboratory. Sometimes we call the teacher. But we have seen that sometimes if we call our colleagues they are able to explain it to us better. This happened in the glass block and titration experiments. (Student, School Z)

Sometimes we receive more help from fellow students than the teachers. When we need help during practical we call the teacher or our friends to help us. I understand it better from my friends. (Student, School W)

The comments from these students in the case study schools seem to suggest that their teachers did not always give them the needed support during science practical activities. This lack of support is likely to breed frustration, which could even result in dislike for science practical work.

Science teachers from both SRC and satellite schools enumerated problems in two areas. These are (a) lack of apparatus and equipment needed for some of the practical activities and (b) time constraint coupled with work overload. These will be discussed in detail in the next two sections.

#### Time allocation for science practical work

Time allotted for science practical activities constitutes a critical dimension of the problem of lack of practical work in the schools as seen in the previous section. In this section, the issue of time is explored using responses and comments from both case study schools and teachers' survey data.

Asked whether practical periods were officially allocated on time tables, 38.0% of science teachers who responded to the questionnaire stated that their time tables did not show any time for science practical work. The remaining 62.0% who indicated that their time tables had periods allocated for science practical work gave a range of two to four periods per week for science practical activities. Science practical periods therefore differed from one school to the other as well as from one subject to the other. Periods for science practical work were seen to be inadequate by 68.0% of the teachers.



In schools where practical periods were allocated on the time table, teachers indicated that they usually used them for theory work. In school X for example, there were three periods for practical work and five periods for theory but HODs indicated that teachers used all the eight periods for theory. According to the teachers, the eight periods were even not sufficient and some teachers had to resort to afternoon classes for the teaching of more theory. Some teachers even used some afternoons and weekends to enable them conduct practical activities with their students. The HOD of school X felt that there was inadequate time even for the coverage of science theory prescribed by the syllabuses and this affected practical work.

We have not been able to cover the syllabus using the normal time. We have to use afternoon classes. That is what we have been doing over the years. If you use the normal time you will not finish and those who are not prepared to go into extra classes are those who are not performing the practical (HOD, School X).

All the HODs shared this opinion. According to them, the number of periods allocated for science lessons (ranging between 6 to 8 periods a week) was not enough. The priority was therefore for teachers to concentrate on the theory part of science and make up for the practical work later. This is what leads to science practical activities not being emphasized in SSS1 and SSS2. Time constraint appears to be a particularly serious problem as the HODs used it to justify the inability of science teachers to conduct adequate science practical activities with students. The reasons given by the HODs suggest that teachers were not ignorant of the need for practical work, but the constraints of time among other factors made them put more emphasis on the theory aspect.

Sometimes when you look at the coverage of the syllabus I am sure that with time, teachers have realized that they should rather spend time giving the students theory, then when they have gotten enough theory they can take them through the practical (HOD, school X).

According to the HODs, teachers believe that somehow students would be able to perform the practical activities in the final examination once they get some little exposure. To enable students get exposure,

practical activities are organized during the third term of the final year as Table 1 seems to portray. This state of affairs required that students perform a number of practical activities within a period of one or two hours. In all the case study schools, students indicated that they were made to perform more than one practical activity during any practical session especially during the final year. Half of the students will be in one room performing one set of practical activity, whilst the other half would be in another room performing a different set of activities and after an hour or so students will swap. Science teachers used the limited time available to conduct as many practical activities as possible in SSS3, to enable students prepare for the science practical examinations. According to students in school X for example, sometimes they performed as many as four practical activities in groups within two hours.

Sometimes for only three periods we are made to do so many different practical activities sometimes four different practical; one on resonance tube, sonometer box, one on heat, one on electricity (Student, School X).

This situation led to students not writing up the practical activity for marking by their teachers. The purpose this kind of exercise serves is only to enable students become familiar with a number of different practical activities. During this period, emphasis on practical work is examination driven, as the following comment seem to portray:

Essentially, what is happening now is that we are only training the students to go and pass the practical examination. Honestly, if the practical is supposed to serve a purpose then it is supposed to complement the theory. But here is the situation where you have done the theory and you are now coming to do the practical so it's not serving any purpose. The practical is supposed to help them pass the examination (HOD, School W).

Also students were made to work in groups due to lack of adequate number of equipment and space. This made participation in practical activities by all members of a group impossible. Many students therefore end up not benefiting from practical activities due to insufficient time to set up the apparatus themselves and take their own readings. Consequently, students have difficulty handling glassware and working independently when it comes to practical examinations. HODs also indicated that students get frustrated with practical work due to faulty apparatus. It is therefore not

surprising that students' attitude to science practical work is influenced by the use of science equipment (Ampiah, 2004).

Analysis of the teachers' questionnaire shows that 88.0% of teachers indicated that their school laboratories were not equipped with adequate apparatus considering the number of students pursuing science. In school Z, the HOD admitted that the school did not have enough apparatus to do practical work. In physics, items such as cells, metre rule, calorimeters, vernier callipers, weights, micrometer screw gauge among others were not available in the school, and had to be borrowed from another school over 20 km away. School Z was therefore a typical poorly resourced school and clearly did not meet the conditions set by the science syllabuses of having a well-equipped laboratory in order for the school to offer science. The situation in school Z was indeed very discouraging, and put a limit on the number of practical activities students could perform. Students in this school were expected to go to the SRC about 20 km away since their laboratory was poorly equipped for performing basic science practical activities. However, this was not for free as the school had to pay for fuel for the bus to convey the students as well as pay for consumables for the practical activities especially in chemistry and biology. According to the HOD, the school did not have the money to pay these bills for students to go to the SRC. Also since the number of students in SSS3 was only 15, it was not cost effective transporting this small number of students in a big bus, which takes over 70 students. Due to this situation, students in SSS3 had never been to the SRC for the two and half years they had been in the school. The HOD of school Z indicated that where apparatus were available for the kind of science practical activities teachers wanted students to perform, students were made to do them. However, during mock and final WAEC practical examinations they always borrowed apparatus from other schools to enable students take the examinations. This could however, not be done for normal school practical work. One therefore wonders how students could out of the blue and with very little experience in practical work be able to perform experiments in WAEC science practical examinations. Instructions from WAEC to the science teachers categorically state that the purpose of the practical test is to find out whether the candidates can carry out simple practical work themselves.

Even for SRC schools, sometimes the inability of students to conduct practical activities was due to the cost involved in purchasing equipment and consumables. For example, the HOD of school X indicated

that for chemistry practical alone, the school had to purchase about five to six million cedis worth of equipment before students could take the final WAEC practical examination. According to him, even though conducting practical activities was very expensive, students did not necessarily pay more for offering science. Due to this, expensive practical work could not be done on regular basis. Similar sentiments were expressed by the other HODs.

### **Conclusion**

The case of these four schools has provided considerable evidence to confirm allegations made by Chief Examiners over the years that the nature of students' weaknesses in the practical examination cast serious doubts on students' involvement in practical activities. This has been acknowledged in the comments and views expressed by students, science teachers, and HODs in the case study schools. It would however, be misleading to suggest that science teachers were unappreciative of the need for practical activities to be performed by their students. The wider picture from this study suggests that mitigating circumstances (lack of equipment, overloaded curriculum) constrain schools and teachers to organise science practical activities to be performed by students. In the SRC schools, teachers complained about insufficient apparatus for some of the practical activities they wanted to conduct. In most cases therefore, it was not a question of non-availability of equipment or apparatus but rather adequacy. If apparatus are either not available or insufficient in some SRC schools, then teachers do not know where else to turn for help. In the satellite schools, teachers complained about poorly equipped laboratories

The finding that time allocation problems and inadequate equipment which results in most students not playing active roles in the performance of science practical work suggests that the organisation of practical work in the schools faces a lot of challenges. There is ample evidence from interviews and observation of students' record of practical work to conclude that practical activities were not organized regularly for students, particularly, in the first two years. However, attempts were always made in the final year to make up somehow for practical work neglected in SSS1 and SSS2 to enable students take the WAEC science practical examinations. Students were therefore, not given enough opportunity to use laboratory based practical activity to solve problems, construct relevant science knowledge, undertake scientific investigations, and promote inquiry in the lower forms and at

regular periods. This could make students feel less confident when it came to practical work. The result of this inadequate exposure to practical activities and lack of adequate practice give credence to Chief Examiner's observation about students not performing enough practical activities.

In the final year, most of the practical activities were organised to prepare students particularly for the final WAEC practical examination. Even where practical periods were fixed on the timetable, teachers normally used them to teach science theory. Similar findings have been reported by Caillods, Gottelmann-Duret and Lewin (1996) in a study of science education in some African, South American and Asian countries.

### **Implication**

Undoubtedly, the acquisition of laboratory skills will require laboratories equipped with all the necessary equipment for students to be able to practice and gain the necessary manipulative and recording skills. However, given the organisational problems associated with practical work faced by these schools which could be a reflection of what may be happening in other schools, it should be possible for the WAEC not to put heavy emphasis on the collection and recording of raw data during the examination. It is pertinent to note that the external WAEC practical examination does not directly assess laboratory skills. Laboratory skills are necessary only for the collection of raw data by students during the WAEC practical examinations. The rest of the skills are not laboratory-based. The WAEC practical examination could focus on observation, using photographs and graphs, processing and interpretation of data, experimental design, reasoning, and problem solving skills using appropriate diagrams and charts without students first collecting raw data and recording them. The CRDD elective science syllabus could put emphasis on the use of demonstrations, simulations, video presentations, and science kits as necessary and sufficient means of teaching these skills at the SSS level.

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## **Interpreting Skills of Senior Secondary School Students in Elective Biology in the Central Region of Ghana.**

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### **Abstract**

Investigation was made into students' proficiency at interpreting biological diagrams, an important component of senior secondary school certificate examination (SSSCE) in Biology Paper 2. In all 303 elective biology students, aged between 15 and 24 years made up of 159 males and 144 females in urban and rural senior secondary schools were randomly selected for the study. A performance task was the instrument used to determine the interpreting skills of the students. Majority of the students seem not able to interpret biological diagrams. Sex, age and the type of school the students attended were found not to be related to their performance at interpreting biological diagrams. Nevertheless, a greater proportion of females than males exhibited the same level of performance in interpreting biological diagrams. The major implication of the results for science education is that a lot of data interpretation exercises should be included in the teaching of biology.

The basic purpose of instruction is not to cause students to memorize facts but to participate actively in the processes that lead to the creation of new knowledge (Brunner, 1966). Knowing, according to Brunner (1966), is a process not a product. Knowledge-getting processes in science and for that matter in Biology are full of skills in which the student needs to be proficient. Akinmade (1992) reported that process skills are the foundation of scientific enquiry and are required for learning facts, concepts and principles necessary for making valid interpretation of biological data. For Finlay (1983), once science process skills are acquired they become very powerful means for mastering content. Shaw (1983) pointed out that process skills that scientist use for practising and understanding science can be put into two categories: basic and integrated process skills. Skills needed to interpret scientific data fall under the integrated process skills.

Students demonstrating the process of interpreting are required to determine a pattern or put meaning into scientific (biological) data presented in any form. They are also expected to justify any meaning put into or taken out of their experiences at the time. Akinmade (1992) reiterated that for a



student to exhibit competency in the use of interpreting skills in science and for that matter in biology, the student must be able to:

1. make generalization from a set of biological data or information;
2. identify cause and effect relationships from biological data;
3. recognize which biological data lend support to an inference; and to
4. draw as many plausible inferences as the data may allow.

Biology is one of the science elective subjects taught at the senior secondary school (SSS) level in Ghana. The assessment in biology takes many forms including grading of students' performance during practical activities. For example, if the dissection of a mammal is done the student might be required to draw the displayed internal organs *in situ* and the drawing and skill of dissection are assessed based on the dissected mammal exhibited. Another form of assessment is to provide performance tasks and investigative projects for the students to work at. Other tasks are multiple choice, short-answer and essay tests. Both internal and external examinations in biology are comprehensive and call for one to demonstrate one's proficiency in the process skills rather than mere recall of facts only. In order to be able to perform well in the West African Examinations Council's (WAEC's) Senior Secondary School Certificate Examination (SSSCE) Biology Paper 2, one needs to demonstrate adequate competence in the process skill of interpreting biological data. It is revealing, after a considerable number of years of experience as a biology teacher, that biology students are unable to interpret biological data satisfactorily. The result is that most of the students score low marks at the SSSCE in Biology Paper 2. This situation has been observed by Rounning and McCurd (1982) and Lassa and Akpan (1988) who commented that secondary school students perform poorly on tasks involving the use of integrated processes.

Padilla, Okey and Dillashaw cited by Akinmade (1992) agree with Baird and Borich (1987) that some amount of overlap exists between integrated process skills and formal operational thought. This suggests that the two constructs are interdependent. By implication it follows that some level of reasoning is a prerequisite for students to be able to interpret biological data that are either in the form of a table, a chart, a diagram or graph. According to Berg and Smith (1994) students with deficient logical thinking abilities such as spatial thinking and proportional reasoning have

great difficulty in interpreting or constructing graphs. The reason given by Berg and Smith (1994) is that many students do not have the mental tools to engage in a high level interpretation of graphs. When students were asked to interpret the concepts conveyed by graphs in a research conducted by Beichner (1990), they performed poorly and the reason was traced to cognitive inability of the students to construct and interpret the graphs. The reason of Beichner (1990) is corroborated by Roth and McGinn (1997) that the lack of competence on the part of students in interpreting data is explained in terms of their experience and the degree of their participation in activities involving interpreting data rather than, exclusively, in terms of their cognitive ability.

Analyses of assessment in science by the British Assessment of Performance Unit (APU) have established that at ages 11 and 13 years, irrespective of criteria being assessed, there are sex differences in achievement (Johnson, 1987; Murphy, 1988). The differences reflect areas in which each sex had prior experience. For example, girls scored better on items relating to health, reproduction, nutrition and domestic situations, whereas boys did better on items concerning building sites, race trucks, spare parts, electricity and many others. Linn and Hyde (1989) have shown that sex differences for science processes are not as great as for science knowledge. They contended that differences appear to be related to learning opportunities both inside and outside school. Simpson and Oliver (1985) have revealed that female attitude toward science becomes more related to their concept of male dominance in science. It has been found out by Weinburgh (1995) that boys show more positive attitude toward science than girls. Ossei-Anto (1996) confirmed that finding when he reported that boys showed more positive attitude towards science than girls in a physics (refraction) task he administered on selected students at Buffalo. However, it was not always the case, because Schibeci (1984) and Al-Hajji (1983) have found out that girls show more positive attitude toward science than boys. The foregoing findings appear to point to the fact that, there is a controversy as to which sex exhibits process skills better in science than the other.

This study was therefore carried out to find out if SSS biology students in senior secondary schools in Cape Coast can interpret biological diagram. It was also to find out if the students' ability to interpret the diagram depended on sex, age and the type of school they attended.

## **Method**

### **Sample**

The sample consisted of 303 final year elective biology students from both single sex and co-educational senior secondary schools in the Central Region of Ghana. It is a region with the highest number of senior secondary schools including the first secondary school in Ghana - Mfantshipim. It has two Universities that run mostly education-based courses.

The 303 participants were made up of 159 males and 144 females whose ages ranged between 15 and 24 years. They came from various home backgrounds ranging from elite to illiterate parents. It is also noteworthy that they came from both endowed and less endowed schools. (An endowed school in this study is one that has adequate number of teachers and teaching-learning materials, while the less endowed has inadequate number of teachers and poor teaching-learning facilities).

In selecting the sample, a list of only the 24 senior secondary schools in the Region that offer elective biology was compiled alphabetically by name on pieces of paper and 15 schools were selected at random using the lottery approach.

A visit was made to all the 15 schools to collect a list of names of all students offering elective biology. All the names on the lists were put together and arranged alphabetically by family name. Serial numbers were assigned to the names and a table of random numbers was used to select the 303 out of a total of 1215 students

### **Instrument**

The instrument was a biological diagram shown as Figure 1 depicting the concept of irritability with a two-item questionnaire developed by the researcher. The task shows four boxes of equal size initially filled with dry sawdust and 10 worms put at the centre of each. The sawdust in boxes I, II and IV had portions wet with water while the sawdust in box III still remained dry. A source of light was placed equidistant from each box. Figure 1 shows the different positions taken by the worms in the boxes after one hour. The diagram was based on irritability in animals. The choice of the concept of irritability was co-incidental, it had no special significance.

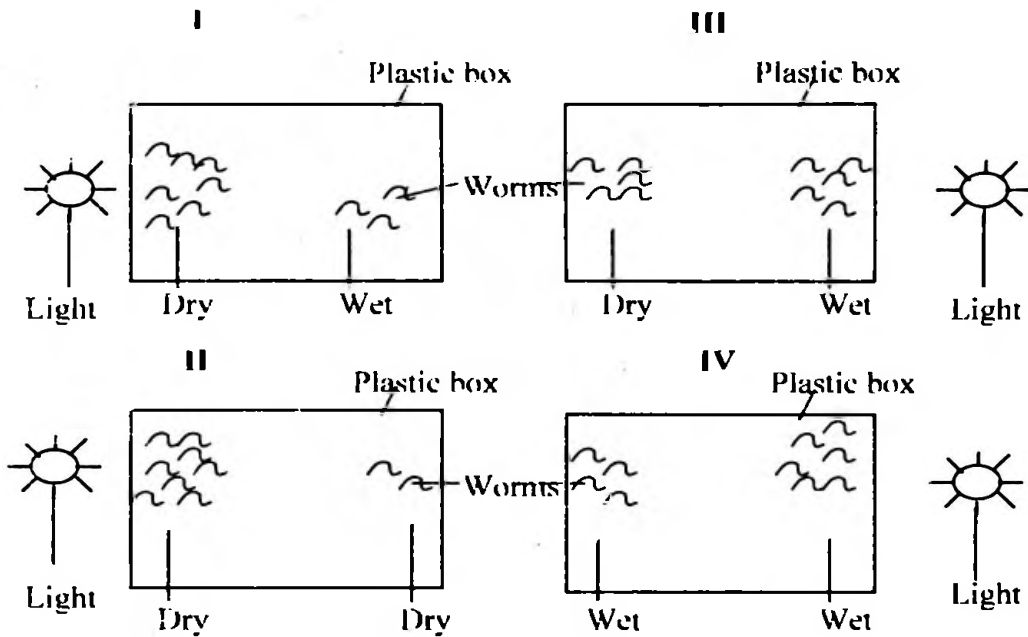


Figure 1. Worms in boxes of sawdust

The questionnaire had two items as shown below. Tick the box of the appropriate response and write where spaces have been provided.

1. How often have you practised interpreting biological data?
 

Often	]	Very often	]
Seldom	[ ]	Not at all	[ ]
  
2. Write your comments about the task.....  
 .....  
 .....

The task developed for this research was dubbed: Process Skills Assessment Task in Biology (PSATB) which is an adaptation of Physics Laboratory Assessment Scheme (PLAS) used by Ossei-Anto (1996). Defending the suitability of an instrument for assessing science process

skills, Ossei-Anto (1996) asserted that a valid instrument does not automatically make another instrument valid, even if both are correlated to each other. Hence, it is suggestive that in assessing any science process skills, an assessment instrument that is valid must be developed. Such an instrument should be unique, complete, independent and unbiased.

### **Procedure**

The schools selected by random sampling were visited and the students concerned were isolated and kept in the classroom or science laboratory. They were given serial numbers, which were preceded by either the letters MS or SS for identification purposes (MS indicated mixed school and SS, single sex school). The task sheets were distributed and read to them in case they were unable to comprehend the task. The students were allowed 30 minutes to complete the task.

The scores were categorized into levels of performance. All those whose level of performance was 1 and 2 or gave wrong or partial interpretation of the diagram in Figure 1 were classified as not having the skill while those who performed at level 3 or gave full and accurate responses were classified as having the skill.

## **Results and Discussion**

### **Students' Performance in Interpreting Biological Diagram**

A scheme for assessing the performance of the students has been shown as Figure 2

Figure 2

**Level of Performance**

**Rubric**

0

**No response**

1

*Wrong interpretation*

**Partially correct interpretation:**

- 2
- Using single variable e.g. worms respond positively to light. Or worms respond negatively to moisture
  - Interpretation that is partially correct.
- Accurate interpretation:**
- 3
- Complete / full response combining two or more variables quoting correct numbers or ratios and giving reason(s) for the observations
- Correct interpretation:**
- (Worms respond to light but not moisture because where there is light and no moisture, the number of worms increases).

Figure 2: Scoring Rubric for Interpreting the Diagrams

The performance of the students has been presented in Table 1.

**Table 1**

*Performance of Students in Interpreting Biological Diagram*

Level of Performance	Frequency	Percent
0 – No response	5	1.7
1 – Wrong interpretation	161	53.1
2 – Partial interpretation	108	35.6
3 – Accurate interpretation	29	9.6
Total	303	100.0

Table 1 shows that the total percentage of students, who made partially correct and accurate interpretation was, 137(45.2%). As many as 161 (53.1%) of the students made the wrong interpretation. It means that a little

more than half the number of students appeared not able to interpret the biological data presented in diagrams. Students who have the skill should be able to interpret the diagrams correctly, but since a relatively large number 108 (35.6%) of students could make partial interpretation, it suggests that their score for that performance is likely to be low. In a biology examination like the SSSCE, a low score for interpreting data will affect the overall score in the paper. It is highly probable that the seemingly poor performance that characterizes biology results could be partly the cause of the low grades in the subject.

In order to find out if the students had any experience in interpreting data, the students were to indicate on a two-item questionnaire incorporated in the biological diagram in Figure 1, the regularity at which they practised. The distribution of their responses has been shown in Table 2.

**Table 2**  
*The Frequency at which Students Practise Interpreting Biological Diagram.*

Response	Frequency	Percent
No response	6	2.0
Often	110	36.3
Very often	43	14.2
Seldom	119	39.3
Not at all	25	8.3
Total	303	100.0

From Table 2 it is seen that about half the number 153 (50.5%) of the students indicated that they often or very often practised interpreting while the remaining half 150 (49.5%) did not practice interpreting biological data. Definitely, since practice leads to perfection, non practice by almost 50% of the students implied that the students are likely not to develop the skill of interpreting biological data and therefore they were likely to perform

poorly in biology. The revelation in Table 2 is in consonance with the reason assigned by Beichner (1990) and Roth and McGinn (1997) that the lack of competence in interpreting data is the result of limited experience and degree of participation in activities involving interpreting data.

The performance of the students in interpreting the biological diagrams was examined to see if any relationship existed either between sex, age, or type of school they attended and their performance. Pearson's  $X^2$ -test values for sex, age and type of school against their performance have been presented in Table 3.

Table 3

*Pearson's  $X^2$ -test Values for Sex, Age and School Type; and Students' Performance in Interpreting Biological Diagrams.  $N=303$*

Variable	$X^2$ -test Values	df	Critical Values of $X^2$ at $\alpha = 0.05$
Sex	2.27	3	7.82
Age	18.22	12	21.03
School type	17.93	15	25.00

With reference to Table 3 none of the  $X^2$ -test values is significant at 0.05 alpha level as far as interpreting the biological diagram was concerned. This meant that sex, age and school type were independent of the performance of the students in the interpretation of the diagrams.

Comparison of the numbers of females and males interpreting the biological diagram has been shown in Table 4.



Table 4  
*Sex of Students and their Performance in Interpreting Biological Diagram.*

Performance Level	Sex	
	Female <sup>a</sup>	Male <sup>b</sup>
0 – no response	3(2.1)	2(1.3)
1 – wrong interpretation	72(50.0)	89(56.0)
2 – partial interpretation	52(36.1)	56(35.2)
3 – accurate interpretation	17(11.8)	12(7.5)

**Note:** Figures in parentheses are percentages while those without parentheses are frequencies.

<sup>a</sup>Total number (n) of females = 144; <sup>b</sup>Total number (n) of males = 159

From Table 4, it is apparent that more females 17 (11.8%) than males 12 (7.5%) appeared to have made accurate interpretation of the biological diagrams. This observation is in line with the findings of Schibeci (1984) and Al-Hajji (1983), but it disagrees with the finding of Weinburgh (1995). This apparent difference was subjected to a t-test at a significance level of 0.05. The t-test values for the mean performance of female and male students on the interpretation of the diagrams shows that the females' performance was not significantly better than that of the males ( $\bar{m} = 1.58$ ,  $SD = 0.72$ ),  $t(301) = 1.083$ ,  $p > 0.05$ .

The age levels of the students and their level of performance in interpreting the biological diagram have been presented in Table 5.

Table 5

*Age of Students and their Level of Performance in Interpreting Biological Diagram.*

Level of Performance	Age <sup>a</sup> in Years				
	15	16	17	18	19 <sup>+</sup>
0 – no response	-	-	1(1.6)	-	4(5.6)
1 – wrong interpretation	1(100.0)	2(33.3)	26(42.6)	96(58.5)	36(50.7)
2 – partial interpretation	-	4(66.7)	25(41.0)	54(32.9)	25(35.2)
3 – accurate interpretation	-	-	9(14.8)	14(8.5)	6(8.5)

Note. Dashes indicate that no values were obtained. Figures in parentheses are percentages while those without are frequencies.

<sup>a</sup> Number (n) of various ages in the research sample were:

15 years 1; 16 years 6; 17 years 61; 18 years 164; 19<sup>+</sup> years 71.

The 15 and 16-year olds seem not able to make accurate interpretation of the diagrams as shown in Table 5. However, only a handful of 17, 18 and 19<sup>+</sup>-year olds appeared to make accurate interpretation in the following percentages: 9(14.8%), 14(8.5%) and 6(8.5%) respectively (see Table 5). It appears that small numbers of students in their late teens seem to interpret the diagram more accurately than those in their early and mid teens even though about half the number seldom practised biological data interpretation as indicated in Table 2. The difference in performance is, however, not statistically significant at 0.05 alpha level.

It was of interest to find out if the type of school attended by the students had any influence on or relationship with their performance. The finding has been presented in Table 6.

Table 6  
*Type of School and Students' Performance in Interpreting Biological Diagrams.*

Level of Performance	Type of School <sup>a</sup>					
	USSF	USSM	UM	RSSF	RSSM	RM
0- no response	2(3.9)	2(2.4)	1(1.1)	-	-	-
1- wrong interpretation	20(39.2)	48(57.1)	45(51.1)	14(58.3)	5(51.4)	29(59.2)
2- partial interpretation	18(35.3)	28(33.3)	33(37.5)	9(37.5)	2(28.6)	18(36.7)
3- accurate interpretation	11(21.6)	6(7.1)	9(10.2)	1(4.2)	-	2(4.1)

Note. Dashes indicate that no values were obtained. Figures in parentheses are percentages and those without parentheses are frequencies.

<sup>a</sup>Type of school and the number (n) in each school that took part in the research: USSF = urban single sex females 51; USSM = urban single sex males 84; UM = urban mixed 88; RSSF = rural single sex females 24; RSSM = rural single sex males 7; RM = rural mixed 49.

It is shown in Table 6 that only small numbers of students from the various types of schools except RSSM seem to make accurate interpretation of the diagrams. Comparatively, more students from urban schools than students from rural schools made accurate interpretations of the diagrams. This suggests that students in urban schools might be predisposed to facilities that enable them practice data interpretation.

Although sex, age and school type appeared to be independent of the performance of the students in interpreting the diagram, the findings showed

that more females than males appeared to have made accurate interpretation of the diagrams. The implication being that more females seem to exhibit interpreting skills than the males but the difference is not statistically significant.

Similarly, students from the age of 17 years and above in selected SSS in the Central Region appeared to interpret the biological diagrams accurately, while those below 17 years appeared unable to interpret them. In the same vein this apparent difference was not statistically significant. The results with the school type and students' performance showed that more students from urban schools than rural schools were able to make accurate interpretation of the diagram. The difference in performance, however, between urban and rural school students was also not statistically significant at alpha level 0.05.

### **Conclusions**

The results show that, almost all the SS 3 biology students from selected SSS in the Central Region of Ghana seem not able to interpret the biological diagrams. Additionally, a good number of the students had no practice at interpreting biological data. Of the few that appeared able to interpret the diagrams accurately a large number of them were females. Similarly, more students from urban schools than rural schools made accurate interpretation of the diagrams. Considering the ages of the students, only 9 (14.8%) of those who were 17 and above years were able to make accurate interpretations of the diagrams and those below 17 years could not.

Although a larger number of females than males appeared to have made accurate interpretation of the diagram, it is not statistically significant, the striking thing about the study was that the males outnumbered the females in the ratio 159:144 respectively, but more of the females than males seemed to make partially correct interpretations of the diagrams. It pre supposes that more girls are likely to pass the biology examinations in Paper 2 at SSSCE than boys even though their grades might be low. The revelation in Table 4 that relatively more girls than boys made accurate interpretation of the biological diagrams, is likely to point to the fact that more girls might make good quality grades in biology at the SSSCE than the boys because accurate interpretation of biological data will likely boost the quality of the grade one makes at the SSSCE.

If some reasoning is a prerequisite for interpreting biological data as contended by Akinmade (1992); Baird and Borich (1987); and Berg and Smith (1994), then one wonders whether the students who were 17 years and above but made accurate interpretations of the biological diagrams exhibited some level of reasoning over those with younger age. The answer to this concern is beyond the scope of this study.

### **Implication for Educational Practice**

The limitations of the study notwithstanding the findings have some implication for educational practice. Since most of the students did not practice interpreting biological data, biology teachers should infuse their lessons with data interpretation sessions. Biology textbook writers ought to revise their books or write new ones and include a lot of varying exercises on interpreting biological data. It is noteworthy that the data must be provided in different forms for them to develop versatility in handling data in different forms.

Furthermore, rural schools need to be well equipped with material and human resources so that students in those schools will have comparable learning experience as their counterparts in urban schools. It is only then that students from both types of schools can be perceived to be equivalent.

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## **The Relationship between Study Habits and Academic Performance: A Case of University of Cape Coast Distance Learners**

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### **Abstract**

This paper examined the relationship between study habits and the academic performance of students on the University of Cape Coast distance education programme. A Study Habits Inventory for Distance Learners (SHIDL) was used to collect data. A total of 879 participants took part in the study. ANOVA, t-test of independence, and Pearson's Product Moment correlation coefficient were used in analyzing the data. The results showed that a statistically significant relationship exists between study habits and academic performance of distance learners on one hand and mode of preparing assignments on the other hand. It is therefore concluded that successful academic performance depends on the development of good study habits. By implication, academic counseling needs to be focused on good study habits.

It is the wish of every student to accomplish his/her goals in education. While in school, the goal of students may be to pass a certain number of courses to obtain a degree. For any student to achieve this goal calls for the development of good study habits that will lead him/her to academic success. To develop good study habits is a complex phenomenon. But the basic truth is that effective study skills must be practiced in order to improve academic performance.

Many students are tempted to find excuses for their inability to perform creditably in their academic endeavours. The case of distance learners on University of Cape Coast programmes is even more serious. They always complain about heavy work load, lack of time to study, interference from family members, financial constraints, and a host of other



problems. While some students are making frantic efforts to study by cultivating effective study habits, others want to sail through without much effort. The question that arises is: Is there any relationship between study habits and academic performance of distance learners?

Much has been written about study habits; the topic is a popular one and it is discussed from multiple perspectives. Literature has revealed that many different terminologies have been given to this concept, some of which include "the art of learning", "effective study", "approaches to learning", "learning styles" and many others (Ezewu 1987; Anim 1994; Pintrich 1995 and Kizlik 1997)

Conceptually, the term study habit is defined as a well-planned and deliberate effort towards understanding and acquiring knowledge. Oloyede and Olatoye (2005) citing Okoye (1981) described study habit as a systematic conscious task of acquiring specific knowledge geared towards a set of standards. Pintrich and Garas (1991) see study habits as behaviours that are easily manifested without conscious exertion on the part of the learner. They are behaviours directed at effective learning. These behaviours are usually manifested in the learners' response to class work, assignments, reading, note taking, concentration, and time management, consultation with teachers and other learners and tactics used in examination (Ezewu 1987; Isangedighi 1997; Umoinyang 1999).

Individuals employ some skills in studying. These skills are related to when, where, and how to study. They are also reflected in the management of study time and the preparation of assignment response. Unconsciously, these skills are practiced overtime to the extent that they become part and parcel of the individual. When these skills persist overtime, they become habitual; hence the idea of study habit. Study habit can be either positive or negative. It is positive when it helps in promoting effective learning and negative when it retards learning. Study habit, therefore, is a good predictor of learning outcomes in schools. Odinko and Ademoye (1999) reported that study habit significantly predicts students' attitude towards English Language.

The primary role of the distance education student is to learn. Under the best circumstances, this challenge requires motivation, planning, and the ability to analyze and apply the information at distance education setting. The process of learning for distance students is more complex than students on the regular programme. For example, Schuemer (1993) observed that that

many distance students are older, have jobs and families which influence their studies. They are equally faced with lack of motivational factors of learning such as contact or competition with other students. It also takes them a longer time to establish rapport with their course tutors because they do not interact with them often. During face-to-face contact, many distance learners feel very uncomfortable with their learning situation.

Distance education learners, especially the beginners, may have some difficulty determining what the demands of a university study actually are because they do not have the support of an immediate peer group, the instructor, or familiarity with the technology being used for delivery of distance education materials. Morgan (1991) noted that those who are not confident about their learning tend to concentrate on memorizing facts in order to complete assignments and write examinations. As a result, they end up with poor understanding of materials.

Bunch-Keemer (2002) asserted that as a student, the key to successful time management is to first develop good study habits. He stated further that the keys to successful study habits are taking control, prioritizing and scheduling time realistically. The use of downtime (breaktime) between classes to go over notes, study an hour or two a day, and slowly build onto study time as an exam approaches are excellent study habits. He cautioned students to schedule their time so that their objectives for studying are met and they must also have prioritized time for work, study, and relaxation.

On using time effectively, Debbie (1998) thought the freedom to do what you want with your time is an intoxicating thing. This is because college students are not forced by anyone to go to class, study, or do homework. However, the effects of making poor choices in time management soon catch up with them. In effect, effective use of time brings success, not only academically but in all areas of life. Anim (1994) in a study of some determinants of study skills found that girls' study habits on time management were less satisfactory than boys. He attributed this to socio-cultural factors in Ghana which stressed on boys having formal education than girls.

Various theoretical formulations explain study habits of students. Witkin's (1950) concept of field dependent and field independent are used to describe how students develop learning styles. Again, a further probe into academic success, is for the student to understand his/her learning style and

how best to learn. How students absorb and process information depends — whether they are verbal learners, visual learners, oral learners, auditory learners, tactile and kinesthetic learners, or some mix thereof (Korybut 2004). Explaining further, Korybut said verbal learners learn best through written materials, like textbooks and articles. Visual learners learn by seeing or picturing information and recalling a mental image of it. Oral learners learn by talking out their ideas. They tend to speak more frequently in class than other students, and profit from student study groups where they can discuss what they have read. Aural learners learn by listening to information. They like class lectures and small group discussions, listen in class more than taking notes, and even taping classes. Finally, he said tactile and kinesthetic learners learn by touching, by doing and by movement. They tend to learn well from role-playing, clinical experience, internships and interactive on-line instruction.

Research has established that students who study in a clear organized environment with supplies can best concentrate on their work and accomplish their tasks efficiently. Kizlik (2005) supported this by suggesting that one can study anywhere, but obviously, some places are better than others. Students are to choose a good physical environment as part of study habits. The locations of some distance learners in Ghana are more advantageous than others. But the onus lies on the students who are resident at difficult geographical areas to make the best out of the situation.

Logan (1995) advised all students to set priorities and not put off things that must be done. To him, procrastination is a common human trait that can be disastrous and that students who manage their activities by continual crisis put themselves under continual high stress. Evidence in the literature suggests that it is better to make a daily or weekly schedule by planning time for class, work, study times/study breaks, extracurricular activities, meals, exercise, personal time and sleep. Scheduling personal time is essential just as planning and recognizing the need for personal time eliminates guilt (Logan 1995).

A research conducted by Anim (1994) on some determinants of study habits among students in Senior Secondary Schools in Ghana, generally, found boys showing satisfaction in study habits than girls; girls on the other hand scored higher in note taking and reading. This study corroborates Fritz (1992) studies where females scored higher than males in reading.

Literature on study habits revealed interesting results. Kumar (1996), in a study of Indian Open University of distance learners, found significant differences in the study habits of distance learners when compared on the basis of marital status, social class, academic stream, employment status, and experience in distance learning. In another study in the USA, the National Assessment of Educational Progress [NAEP] (1994) found that there is a positive relationship between good study habits and academic performance in history and geography. The results show that the better students perform academically, the more likely they are to discuss their studies at home every day and again, better performing students were also likely to read more than 70 pages a day. By implication, distance learners who discuss their assignments at home are likely to perform better academically.

A synthesis of all the research literature on study habits point to the fact that good study habit correlates positively with high academic performance. In effect, positive study habits are predictors of success in school. Learners possess different study habits and that influences the level of comfort in educational settings. Nevertheless, distance learners must develop the appropriate study habits that are likely to accelerate their learning.

The purpose of this study, therefore, is to determine the relationship between study habits and academic performance of distance learners. Apart from investigating the extent to which study habits impact on academic performance of distance learners, the researchers examined the differences in the study habits of the different categories of distance learners. For example, marital status, programmes being pursued, and age.

### **Hypothesis**

In the light of the problem stated, the following research hypotheses were formulated and tested:

1. Ho: There is no statistically significant relationship between study habits and the academic performance of distance learners.  
Ho: There is no statistically significant difference in the study habits of married and unmarried distance learners.
2. Ho: There is no statistically significant difference between the study habits of Basic Education and Business students pursuing the distance education programmes.

3. Ho: There is no statistically significant difference among the study habits of distance learners below 30 years of age, between 30 – 50 years and those above 50 years.

### **Method**

#### **Participants**

Participants were drawn from level 200 and 300' distance education students of the University of Cape Coast. Going by the study centre lists provided by the Centre for Continuing Education, UCC, there were about 6097 level 200 and 300 students. Levels 100 and 400 were left out because they were either very new to the system or too busy with their project work. Both stratified and purposive sampling techniques were used with the focus on factors such as marital status, programme being pursued, and age were used to select respondents. Five hundred and forty five (62.0%) were level 200 students while 334 (38.0%) were level 300 students. Ashanti region had 207 respondents while Central and Eastern had 116 and 121 respectively. The number selected from Volta and Western regions were 102 and 118 respectively while Brong Ahafo recorded 88 respondents. The number selected from Greater Accra, Northern, Upper East and Upper West regions were 65, 23, 19 and 20 in that order. In all 879 undergraduate students in all the 10 regional centres in Ghana participated in the study bearing in mind the ratio of students' distribution in all the regions.

Five hundred and twenty one (59.3%) of the sample were males while 358 (40.7%) were females. Thus, in the study, there were more males in the sample than females. Regarding their age distribution, 467 (53.1%) were between 30 – 50 years old while 339 (38.5%) were below 30 years of age. Only 73 (8.3%) were above 50 years. Seven hundred and sixteen respondents (81.5%) were pursuing the Diploma in Basic Education programme while the rest 163 (18.5%) were pursuing the Business programme. On marital status, 690 (78.5%) were married while 189 (21.5%) were unmarried. It was against this background that the main data were analyzed to determine the relationship between study habits and academic performance of distance learners.

#### **Instrument**

A Study Habits Inventory for Distance Learners (SHIDL) which was developed, after an extensive literature review, was used for the study. Both

open and close ended items featured in the instrument. Most of the items were structured on a five point Likert scale of strongly disagree (1), disagree (2), no opinion (3), agree (4) and strongly agree (5). The higher the score, the higher the relationship between study habits and academic performance. The SHIDL instrument was in two parts. The first part was the biographic section which requested information on gender, age, year level, level at which one teaches, programme being pursued, and marital status. The second part had five sub sections labeled A to E and measured five critical areas of study habit. Sub section A on time management contained 14 items while sub section B on 'when to study' had 15 items. The other three sub sections are (C) 'where to study' (12 items); (D) 'how to study' (27 items) and (E) 'preparing assignment response' (22 items). The last item under each sub section was open-ended and requested respondents to list 3 other things they did but not mentioned in the section.

The instrument was pre-tested at Akatsi Study Centre and that helped to modify items which were not very clear. The inventory had a reliability co-efficient alpha of 0.84. A master sheet bearing the registered number of respondents was prepared and used to collect information regarding the academic performance of the students from the Assessment Unit of Centre for Continuing Education. The scores were entered against the responses of each participant. The scores of the second semester in English and Mathematics were used for the Education students while Management II and Law of Contract II for the Business students were used because they are core courses taken by all students on the two programmes. The average scores in the two subject areas were used to determine the academic performance for each student. Different academic subject areas were used to determine the academic performance of the two categories of students because they do not do the same courses. However, it is envisaged that irrespective of the programme being pursued, the development of effective study habits is likely to positively affect academic performance.

### **Procedure**

The SHIDL instrument was administered on Sundays' Face-to-Face sessions during break before the On-Centre Teaching Practice for Education students and additional tutorials for Business students. Sunday was chosen because we did not want to interfere in the tutorial sessions that preceded the written quiz on Sunday morning. The instruments were administered by

the Resident Tutors assigned to the various centres. They were, however, assisted by the Centre Co-ordinators.

The selected sample was grouped in one large lecture hall and the essence of the study explained to them. They responded to the questionnaire and handed it in on the same day. This process was adopted and that helped to achieve high return rate. The responses of the students were coded and the scores obtained were analyzed using percentages, means, and standard deviation. Independent t-test was used to determine the level of difference between the study habits of married and unmarried and DBE and DBM programmes respectively. On the other hand, inter-correlational matrix was employed to examine the relationship between study habits and academic performance. ANOVA was used to determine the difference among age groupings of respondents.

### Results

It was hypothesized that there is no statistically significant relationship between study habits and the academic performance of distance learners.

Table 1 presents the analysis of the comparison

Table 1: Inter-Correlational Matrix for Study Habits which affect Academic Performance of Distance Learner

SN	Variables	Academic performance	Time management	When to study	Where to study	How to study	Preparing assignment	Total Study Habit
		1	2	3	4	5	6	7
1	Academic performance	1.000	-.025	.016	-.005	.003	.070*	.617*
2	Time Management		1.000	.617**	.343**	.420**	.355**	.683*
3	When to study			1.000	.474**	.484**	.425**	.764*
4	Where to study				1.000	.438**	.333**	.614*
5	How to study					1.000	.486**	.790*
6	Preparing Assignment						1.000	.792*
7	Total Study Habit							1.000

\*Correlation is significant at the 0.05 level (2 – tailed)

\* \*Correlation is significant at the 0.01 level (2 – tailed)

Table 1 shows several correlations of the variables for study habits of distant learners. Academic performance was significantly associated with preparing assignments, ( $r = .070$ ;  $p < 0.01$ ). This means that although there was a relationship between academic performance and mode of preparing assignments it was low. Furthermore, the correlation of academic performance with time management and how to study show values of .003 and .025 respectively which are interpreted as very low, virtually no relationship. On the other hand, academic performance correlated negatively with when to study ( $r = - .016$ ;  $p < .05$ ) just like where to study ( $r = - .005$ ;  $p < .05$ ). This inverse relationship indicated that high academic performance has nothing to do with when and where one studies.

Time management as a study habit also correlated with how to study positively showing a medium relationship ( $r = .420$ ;  $p < .01$ ) while in the case of when to study it had a high relationship ( $r = .617$ ;  $p < .01$ ). The same variable correlated with where to study and preparing assignments showed a definite positive relationship but the relationship was low ( $r = .343$ ;  $p < .01$ ) and ( $r = .355$ ;  $p < .01$ ) respectively. On its part when to study correlated positively showing a medium relationship with where to study ( $r = .474$ ;  $p < .01$ ), how to study ( $r = .484$ ;  $p < .01$ ) and preparing assignments ( $r = .425$ ;  $p < .01$ )

Similarly, where to study showed positive medium relationship when correlated with how to study, ( $r = .438$ ;  $p < .01$ ). However, the relationship between where to study and preparing assignments, even though positive, is low ( $r = .333$ ;  $p < .01$ ). How to study correlated with preparing assignments ( $r = .486$ ;  $p < .01$ ) which is a positive medium relationship. Finally, the study has shown that total study habits correlated with academic performance ( $r = .617$ ;  $p < .01$ ). This shows a high relationship between study habits and academic performance.

The second hypothesis was that there is no statistically significant difference in the study habits of married and unmarried distance learners. This view was informed by the assertion that married couples have too many commitments that do not allow them to cultivate good study habits.



Table 2 shows the means and standard deviations of the study habits based on marital status. Table 2: Independent t-test Analysis of Differences in Study Habits of Married and Unmarried distance learners

Variable	Married (n=690)		Unmarried (n=189)		t value	P
	Mean	SD	Mean	SD		
Time management	34.28	5.61	33.96	5.52	.687	.701
When to study	41.12	6.44	40.60	6.20	.996	.555
Where to study	27.71	4.14	27.50	4.39	.618	.243
How to study	59.65	9.30	59.67	9.60	-.028	.953
Preparing Assignment	64.10	11.01	63.44	12.37	.701	.028*
Total Study Habit	226.86	27.50	225.17	28.50	.739	.389

\*p < .05

The analysis shown in Table 2 revealed that there is no statistically significant difference between married and unmarried distance learners in terms of time management,  $t(879) = .687$ ,  $p < .701$ ; when to study,  $t(879) = .996$ ,  $p < .555$ ; where to study,  $t(879) = .618$ ,  $p < .243$ ; and how to study,  $t(879) = -.028$ ,  $p < .953$ . However, statistically significant difference was recorded in terms of mode of preparing assignments,  $t(879) = .701$ ,  $p < .028$ . This result shows that there is a statistically significant difference in the study habits of married and unmarried distance learners. The difference is in the mode of preparing assignments. The null hypothesis is therefore rejected.

It was also hypothesized that there is no statistically significant difference between the study habits of Basic Education and Business students pursuing the distance education programmes. The result of the analysis is shown in Table 3.

Table 3: Independent t-test Analysis of Differences in Study Habits between DBE and DBS distance learners

Variable	DBE (n=716)		DBS (n=163)		t value	P
	Mean	SD	Mean	SD		
Time management	34.50	5.42	32.91	6.09	3.317	.056
When to study	41.30	6.22	39.71	6.97	2.882	.015 *
Where to study	27.78	4.10	27.13	4.55	1.788	.083
How to study	59.87	9.17	58.69	10.20	1.455	.774
Preparing Assignment	64.44	11.18	61.84	11.67	2.653	.149
Total Study Habit	227.91	27.04	220.28	29.77	3.185	.120

\*p < .05

Evidence in Table 3 suggests that there is no statistically significant difference between the study habits of Basic Education and Business students in terms of time management,  $t(879) = 3.317$ ,  $p < .056$ ; where to study,  $t(879) = 1.788$ ,  $p < .083$ ; how to study,  $t(879) = 1.455$ ,  $p < .774$ ; and preparing assignment,  $t(879) = 2.653$ ,  $p < .149$ . However, statistically significant difference was noted in terms of when to study. It is concluded that there is a statistically significant difference in the study habits of distance learners pursuing Basic Education and Business programmes. The difference is in when to study. The research hypothesis is, therefore, rejected.

Another hypothesis formulated for the study was that there is no statistically significant difference among the study habits of distance learners below 30 years of age, between 30 – 50 years and those above 50

years. The results of the analysis based on this age groupings is shown in Table 4.

Table 4: Rating of Study Habits of three age range groupings of distant learners

Variables of Study Habits	Below 30 years (n = 339)		30-50 yrs (n = 467)		Above 50 yrs (n = 73)		F	P value
	Mean	SD	Mean	SD	Mean	SD		
Time management	33.86	5.73	34.36	5.52	34.93	5.30	1.451	.235
When to study	40.51	6.70	41.39	6.19	40.85	6.09	1.907	.149
Where to study	27.32	4.25	27.81	4.20	28.36	3.73	2.426	.089
How to study	59.59	9.00	59.46	9.08	61.18	12.27	1.072	.343
Preparing Assignments	63.89	11.97	63.58	10.89	66.67	10.61	2.375	.094

\* $p < .05$

Table 4 shows that the difference among the three age groupings in time management,  $F(2, 879) = 1.451$ ,  $p < .235$ ; when to study,  $F(2, 879) = 1.907$ ,  $p < .149$ ; and where to study,  $F(2, 879) = 2.426$ ,  $p < .089$ ; were statistically not significant. Similarly, the difference among the age groups in how to study,  $F(2, 879) = 1.072$ ,  $p < .343$  and mode of preparing assignments,  $F(2, 879) = 2.375$ ,  $p < .094$ ; were also not statistically significant. The null hypothesis that there is no statistically significant difference among the study habits of distance learners in terms of age groupings is, therefore, accepted.

### Discussion

The first hypothesis that there is no significant relationship between study habits and academic performance of distance learners was only partially supported. The findings showed low relationship between academic performance and mode of preparing assignments, time management, and how to study. This study corroborates the study conducted in the USA by the National Assessment of Educational Progress NAEP (1994) that there is a positive relationship between good study habits and academic performance in history and geography. On the other hand, the inverse relationship found between high academic performance and when and where to study conforms to the suggestion that one can study anywhere, but obviously, some places are better than others (Kizlik, 2005).

Distance learners are scattered all over in the ten regions of Ghana. One can appreciate the difficulties that some of the learners face especially in deprived areas of the country. Certain areas are poorly developed lacking basic utility services such as electricity and water. Some areas are just anti-edu-co-genic, yet, all distance learners are expected to study and pass their examination. While the above explanation appears persuasive and tenable, it is important to note that the generally low correlation observed implies that distance learners are likely to adopt their own unique study habits which eventually are likely not to be helpful enough in their academic performance.

The study has brought into focus marital status, programme pursued and age as important intervening variables in determining the extent to which distance learners' study habits affect their academic performance in Ghana. It has emerged from the results that significant difference exists in the study habits of married and unmarried distance learners in the variable on preparing assignment. The findings also revealed that significant difference exists between distance learners pursuing Basic Education and Business programmes on the variable when to study.

While we reject hypotheses 2 and 3 on the basis of differences in the variables as preparing assignments and when to study, hypothesis 4 is however accepted that no significant difference exists among the age groupings of distance learners on time management, when to study, where to study, how to study, and mode of preparing assignments.

The results are quite intriguing as the finding supports what Kumar (1996) stated in his study that significant difference exists in the study

habits of distance learners when compared on the basis of marital status, social class, academic stream, employment status, and experience in distance learning. The results give enough grounds to conclude that marital status, programme pursued and age account for students cultivating different study habits.

It is quite fascinating to understand the dynamics of the educational environment in which Ghanaian students operate. Generally, distance learners are the product of the socio-cultural and economic environment of the Ghanaian system. Finance, family, accommodation, transportation, religious commitment as well as demands of job performance are but some of the challenges that face the students. The findings, therefore, seem to suggest that married and unmarried, Education and Business students have different modes of study in terms of assignments and when to study.

### **Conclusion**

This research has produced evidence to show that there is a positive relationship between academic performance and study habits of distance learners. Since the relationship is high for the total study habits, the findings have given us hope to support the contention that good study habits are prerequisite for high academic performance. Again, this study clearly has established that no matter the location, one can pursue any academic degree by distance. This has lent credence to the philosophy UCC has enshrined in the academic programmes of distance learners that one can obtain UCC degree by distance. It has also been established that there is a close relationship between time management and how to study, where to study and preparing assignments and where to study. The contributions of the various variables considered in the study confirm the fact that for effective educational success to be achieved there is the need for distance learners to develop the skills that are essentially viable for their academic performance.

### **Implications**

The research on study habits is an important avenue for assessing the modes of distance learners' styles for learning and interacting with the learning materials. A striking implication derived from a study like this reaffirms the belief that no matter the age level, students can perform academically. This implies that the programme can open itself to many

people irrespective of age. This is quite relevant as research has shown that normative data indicate that some types of skills stay at the same level or continue to increase throughout adulthood (Blanchard-Fields & Hess, 1996).

Secondly, the distance learners themselves must also make conscious effort at cultivating good study habits by paying particular attention to how they manage their time, when, where and how they study and finally show concern for the mode of preparing assignments. One way for students to build such a commitment for studies is for them to teach one another from their own successes that focus on which strategies worked and which did not work.

Again, it is reasonable to say that effective instruction and successful learning are not achieved by chance. This contention has stressed the fact that the University must help students learn how to set appropriate goals, which then, will form the foundation for developing good study habits. A corollary to the above is that institutions running distance education programmes should not assume that all is well with distance learners. They need to examine the causes of poor study habits of distance learners and try to eliminate those that can easily be dealt with.

Finally, the significant impact of study habits on the academic performance of distance learners as established by this study shows the supremacy of good study habits in striving to achieve academic excellence. To help low performing distance learners, Course Tutors are enjoined to intensify their academic counseling role with a focus on how to cultivate good study habits. It is envisaged that this will bring about meaningful learning habits and consequent high academic performance.

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## **Adolescent Classroom Peer Interactions and Academic Work: A Case Study of Three Senior Secondary Schools in Cape Coast**

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### **Abstract**

The study sought to investigate whether adolescent classroom peer interactions impact on students' academic work either positively or otherwise. This was done through a case study of students' interactions during the teaching and learning process in three senior secondary schools (S.S.S.). The study involved 92 mid and late adolescent boys and girls ranging from 16-20 years, the mean being 18 years for both genders. The results from the case study revealed that the quality of peers' interaction in the classroom impact on students' academic work. The major findings were three in all, namely, a) In single sex schools, both boys and girls were equally supportive of one another academically while in the co-educational schools, girls were more supportive of one another academically, b) Unaccepted and victimized students were often subjected to peers teasing and ridicule which made them withdraw from academic activities) c) Peer tutoring was a regular feature among peers in the classroom as a complementary work to formal classroom instructions.

In Ghana and elsewhere on the continent of Africa, peer influence is usually linked with drug abuse and teenage sexual aberration. Dickson (1991) and Hayibor (1997) are examples of studies on peer influence leading to drug abuse. Other studies have also focused on achievement and other influencing factors. Examples of such studies are [Fobih and Koomson (1992); Amissah (1992); Brown (1996) and Ampadu (1996)]. However, available literature revealed that studies on peer relationships and academic achievement are yet to be undertaken in Ghana.

Shapiro and Cole (1994) share the view that peers can strongly influence academic achievement. They mention strategies such as peer monitoring of self-monitored behaviour or peer tutoring of academic subjects which often helps to facilitate the maintenance and generalization of self-managed behaviours. An example of a more elaborate programme that combines self-management and peer interventions is Reciprocal Peer Tutoring (R.P.T.) (Fantuzzo and Rohrbeck, 1992).

In recent times there have been few studies on peer relationships and their influence on academic achievement such as Wentzel and Caldwell

(1997); and Ladd, Kochenderfer and Coleman (1997). Unfortunately, these are all from outside Africa. The findings of Wentzel and Caldwell (1997) together with those of Ladd et al (1997) for example clearly attest to the fact that peers influence academic achievement in America.

According to Agyeman (1986), the classroom as a social system has a formal structure and an informal structure. The formal structure of the classroom is made up of the pupils and the teachers in the cases of primary schools or students and teachers (who alternate the classrooms according to the subjects they teach) in the case of the secondary and tertiary schools. The teacher is usually aware of this formal structure because he/she is a member of it but may not always be aware of the existence of the informal structure in the classroom because he/she is an outsider to it (Agyeman, 1986).

Agyeman (1986) further stipulates that in addition to the formally organized class as a social unit, there exist in every classroom informal groups (could be said to be synonymous with peer groups) which the learners form spontaneously and members of these informal groups develop subcultures within the classroom culture. Even though the formal organization of the class overshadows these groups, Agyeman (1986) is of the view that their existence and their subcultures are of potent force to reckon with because these various groups have varying effects on the classroom dynamics. Some peer groups may help their members to complement the learning process, thus promoting the achievement of learners; others may lead members to rebel against the classroom norms and authority and thus disrupt the learning process. He concludes that the teacher's awareness of the informal group is very essential for once a teacher detects the network of such peer groups, he can either control them within a reasonable limit or use them for positive purposes.

The following are three techniques suggested by Agyeman (1986) which the teacher could use for the detection of the network of the informal groups:

1. **Observation technique.** The teacher does constant and in-depth observation of the members of his/her class to know who talks to whom, or plays with whom, or works with whom more often and/or successfully.

2. **Interview technique.** The teacher may from time to time interview the members of his class about their play mates or work mates.
3. **Sociometry.** This technique was first used by J. L. Moreno in Austria before 1914 (Rogers, 1972; Agyeman, 1986). According to Rogers (1972), the sociometric test is used to discover groupings and to disclose associations within a group. For example, each learner in a class may be asked with whom he/she would like to be associated in some common group activity in the classroom or on the playground or nominate his/her best friends. Sociogram is a graphic representation of the relationships thus revealed.

The sociogram may be examined for the following points:

- i) Which are pairs, that is, which persons name each other? Who are leaders or stars in the group— that is, which ones are most often preferred as associates? Which are chosen by no one?
- ii) Is the group divided into cliques or subgroups comprising of individuals who name each other, but with few of them naming individuals not within the same sub-groups?
- iii) Which individuals or sub-groups are cut off from the main group?

Rogers (1972) states however that the sociogram merely points the relationships; it does not explain them. Adolescents may be asked to explain the reasons for their choices at the time they are made. This enables the teacher to obtain insight into values held by the group.

As Agyeman (1986) puts it, the knowledge of the sociometric picture of the classroom is most valuable to the teacher. For example, where a teacher detects social “isolates” he/she could help them to get integrated into the class group or protect them from becoming the “whipping boys/girls” in the classroom. The teacher can also use the “star” of his/her class to achieve certain useful ends such as controlling discipline in the

classroom. The importance of the sociometry for the purpose of giving guidance and counselling in the classroom cannot be over-emphasized (Agyeman, 1986).

Sprinthall and Sprinthall (1990) suggest that in the school setting in order for educators to help the adolescent peer groups, the variety of school programmes, such as, involving peer and cross-age teaching, peer counselling, community internships is important. This is because such role taking can involve genuine responsibility because Erikson, as cited by Sprinthall and Sprinthall (1990), makes it clear that to assist growth, the adolescents should be provided with increasing amounts of independence and responsibility. In the above-enumerated programmes by Sprinthall and Sprinthall (1990) teenagers learn to teach, counsel, care for younger classmates. Such responsibilities stimulate their own leadership development and psychological maturation.

The adolescent today is confronted with a complex social world in which he/she is largely segregated from adults who might guide him/her. These adults are unable to direct the adolescent due to his/her confinement to the boarding house for the greater part of each year during his/her senior secondary school education. Even during vacations, he/she sees less of his/her parents who are often preoccupied with working to earn a living. In these circumstances the adolescent faces: a) Conformity to the social rules and norms of peers; b) Peer influence on his/her academic achievement either positively or negatively.

A study conducted by Wentzel and Caldwell (1997) in the United States of America for instance has proved that peer relationships in early adolescence are related to academic accomplishments. Is this true for adolescents in Ghana? The purpose of this study was to find out the following;

1. What are the dynamics of peer relationships in the classroom?
2. Do healthy classroom peer interactions promote learning?
3. How do peer relationships enhance or impede classroom academic work?

## Method

### Participants

The target population is all senior secondary school students in Cape Coast Municipality. However, the accessible population is students from three of the nine senior secondary schools (S.S.S) in the Cape Coast Municipality. Of these three are boys' schools, two girls' schools and four co-educational schools.

The researcher employed both the probability sampling (i.e. simple random technique) and non-probability sampling (i.e. purposive sampling technique) procedures to arrive at the subject for the study. Initially, purposive sampling technique was employed to select one group of students (i.e. SSS 2) from the three groups (i.e. SSS 1, SSS 2, and SSS 3) in the nine senior secondary schools in the Cape Coast Municipality. The reason for the choice of Form 2 instead of all the three stages is that at the time of data collection SS1 students had not been in the schools long enough to have established any meaningful peer relationships. SS3 students being examination candidates were feverishly preparing for their mock examinations and were from all indications not prepared to take part in the data collection.

Secondly, three schools, one boys, one girls and co-educational, were selected using purposive sampling technique for non-participant classroom observation by the researcher because the literature review reveals that peer relationships have different shades and intensity depending on whether the school is all boys, all girls or mixed. Therefore the schools were selected based on the afore-mentioned categories.

According to Cohen and Marion (1994), in purposive sampling, the researcher handpicks the cases to be included in the sample on the basis of their judgement of their typicality. In this way, they build up a sample that is satisfactory to their specific needs. This explains the use of this method of sampling.

Having thus selected the SS2 students using purposive sampling technique, the researcher employed the simple sampling procedure which allows every member or element in the population to have a chance of being chosen in the sample (Ary Jacobs and Ravavieh, 1993) to select the schools for the study. The researcher wrote the names of the two girls' schools on slips of paper and a colleague was asked to select one. The

same procedure was used in the cases of the three boys' schools and the four co-ed institutions. The researcher then in consultation with the Assistant heads for academic affairs identified the number of streams at the SS 2 level in the each of the three selected schools. With the use of the ballot system, the researcher wrote the various streams on pieces of paper and the Assistant head for each of the three schools drew one. Students from one Science Class, Technical Skills class and Business Class emerged as subjects.

A total number of 92 SS2 students, 32 from co-ed and 30 each from boys' and girls' schools respectively were selected for the study. The age range was 16-20 years and the mean was 18 years for both genders.

### **Instrument**

The researcher made use of her own classroom observation guidelines having been guided through the literature review. This instrument is meant for a non-participant classroom observation of peer interactions and behaviour and teachers' reactions to these as teaching progresses. There are two sections. These are Section A and Section B:

- i) Section A requires the researcher to stipulate the school, the programme of the sampled subjects and the subject for observation.
- ii) Section B has guidelines meant to help the researcher make the right remarks about classroom peer interaction during teaching.

Akyeampong (1997) states that relatively little standardized instrumentation is required in a qualitative research since the researcher is essentially the main "measurement device" in the study. However, he agrees with Maykut and Morehouse (1994) that all qualitative researchers share similarities in their sources of data: interviews, field observation as well as documents and regard the researcher as the key instrument in the collection and analysis process therefore in terms of validity only face validity was done through the assistant of experts in Guidance and Counselling, UCC and Psychologist from University of Ghana..

## **Procedure**

The researcher undertook a nine-week regular non-participant classroom observation in three (3) selected schools - one boys' school, one girls' school and one co-educational school. The rationale for the selection as indicated earlier under sub-heading METHOD was to ensure representation of the different types of senior secondary schools in the Cape Coast Municipality. The other reason is that peer relationships are alleged to take on different shades in the three types of secondary education (Kutnick et al, 1997) and of course the researcher could not have covered all the nine schools in the classroom observation. Students were also randomly selected and interviewed during the observation in the three schools.

The researcher used naturalistic field note recording and ethnographic technique of reflection and progressive focusing (Kutnick et al, 1997). The researcher was guided by the literature review to identify broad categories within which the observations could be made and discussed namely:

### **Student behaviour viz,**

- a. Actions of particular students
- b. Peer interactions
- c. Students reflections on their classrooms as a social entity
- d. Communication among students

Upon agreement with the heads of the three selected senior secondary schools, the researcher observed and recorded events in each class for all teaching sessions, each class was observed over a three week period and she then moved on to the next school/class for observation until observations were made in all three classes/schools. It should be emphasized that the researcher was in each class from the first period to the last period, taking rest only during the breaks.

The case study report covers two important areas. The first is in the form of a summary of the observation transcripts and interview notes identified by school. In the report, the three schools and teachers are renamed for confidentiality. For easy reporting, only the first names of students are used. All indented portions of the report represent either direct

quotations noted by the researcher or reflective summaries of observations made by the researcher. The information collected represents observational and comparative approach using ethnographic techniques such as recording, reflecting to note classroom peer relationships and academic competence.

The findings are reported and analysed based on data pool across all the three case studies of the three senior secondary schools. In other words, it was not restricted to one site but involved a cross-site analysis. Nonetheless, issues peculiar to one school but not to others are noted where relevant and their significance explored and discussed. The key findings are supported for the most part by illustrative quotations which are indented.

Moreover, it was sometimes necessary to edit the interview transcripts and even the issues noted during observations to help to provide clarity and brevity. Thus sections of transcripts were reworded or rephrased and sometimes explanations provided for local jargons or colloquial phrases used by subjects. Often different quotations from different case study schools were used to show variety in the way peers behaved in the classroom or the kind of emphasis interviewees gave to a particular issue. Together, these quotes provided proof of validity for the study adding credibility to the themes that emerged from the analysis. In addition, the role the researcher/observer played in observational process was central to the production of the case study report and analysis.

### **Results**

The findings are reported and analysed based on data pull across all the three cases studies of the three senior secondary schools. Nonetheless, issues peculiar to one school but not to others are noted where relevant and their significance explored and discussed. The key findings are supported for the most part by illustrative quotations which are indented. Often, different quotations from different case study school were used to show variety in the way peers behaved in the classroom or the kind of emphasis interviewees gave to a particular issue.



1. What are the dynamics of adolescent peer relationships in the classroom?

### **Report on Student Behaviour**

Observations covered three different aspects of student behaviour during classroom interactions. The aspects are:

1. Actions of particular students
2. Peer interactions
3. Students' reflections on their classroom as a social entity

### **Actions of Particular Students**

Observations showed varieties of actions (both acceptable and unacceptable) of particular students in all the three school/classes.

In School A, the presence of teachers in the classroom did not deter particular students: they acted freely without inhibitions:

During an English lesson, Jenneive, Baaba and Awo were not involved in the reading of the passage but were talking at the back of the class. However, they were ahead in answering the teacher's questions on the passage. The mates called them "magicians". They replied, "So we are. What of that to you?"

Students were uncommonly bold in expressing their feelings and in giving of feedback on the topic of the comprehension passage:

Tr: What do you expect to find in a casino?

Jenneive: Striptease (wiggles body. Mates laugh)

Baaba also saw everything in terms of boy-girl relationship and contributed boldly to the discussion of the passage in terms of that.

Brilliant students often displayed their ability in class. Jenneive was a typical example. Surprisingly mates were never irritated by her actions.

unlike in the cases of other students. Jenevive and Joycelene were very good in mathematics but Jenneville, the tough one always tried to monopolise that position. The whole class often engaged in a healthy competition with one another.

Students' favourite math teacher Mr. 'D' was drilling students with a lot of sums. Jenneville carried the day by getting every mathematical problem correct. Mates kept calling on her for help, even Awo the "shark" (i.e. the most brilliant) called on Jenneville for help. To everybody's surprise, Awo shouted, "shit" when she got the answer wrong. Mates reprimanded her, telling her to be a lady.

Students in School A freely spoke their minds to mates whenever the need arose. There were several instances as observations showed:

The English teacher was absent so the whole class was engaged in a discussion on study pals. Suddenly, Rose rushed to the chalkboard to put mathematical problem on it. The class was furious:

*Class:* What do you think you are doing?

*Rose:* I have discovered a mistake with one of the sums Mr. 'D' gave us.

*Baaba:* Hey girl! You were working mathematics instead of contributing to the discussion. Ambitious criminal! Get involved!

*Rose:* You all act silly sometimes and someone must look out for you. (The whole class laughs). You see I have discovered the mistake for you all.

Another time that mathematics lesson was in progress; Kathy had a problem understanding how to work a particular problem. She kept calling on the teacher to help her. Mates were bored with her and they started laughing at her. She sharply rebuked them:

*Kathy:* Hey! What's funny? We are all here to learn.

*Bauba:* Please don't come and swallow us up, madam whale.

*Kathy:* Then let me be. (that is leave me alone)  
With this comment she waited on the teacher to help her get the concept. Teacher asked Mildred to help her.

Miss 'X' was discussing students' test papers with them in an English lesson. Susana got up suddenly and demanded an explanation from teacher as to why she was always given between 21 and 27 over 40 for her exercises:

*Susana:* As for today Miss 'X', tell me why you always give me between 21 and 27 over 40.

*Tr:* Damn you! Damn you Susie!  
(Angrily)

Mates shut Susana down and asked the teacher to go on with her tips on how to answer questions effectively. They teased Susana with "what you sow is what you reap". meaning what she put in her test was what she had got.

Few students in the class appeared to be timid due to mates ridicule. Such students were often quiet and reserved in class.

English lesson was in progress as usual. For once Margaret got up to contribute to the discussion. Mates made fun of her pronunciation:

*Mirekuwaa*: Listen to her pronunciation of "issue", affectation!

Class whispered, "Oburoni Petε", meaning Margaret was aping whites in their pronunciation even though she is black. Margaret quietly sat down and she was not heard of again for the rest of the day.

In School B, observations showed that there were peculiar actions by particular individuals in the observation class. The school being a co-educational one, the actions of students were either typically girlish or typically boyish. One student, Obidiaba, a notorious attention seeker sought attention from all the teachers, male or female and peers. Rebuking comments did not affect her. She often rebuked them with her nonchalant attitude. On entry into the classroom every morning, she would announce her presence with the usual sentence, "I am in O-O-O! Everybody humoured her but the English teacher.

The English teacher and the class were engaged in a serious discussion about elements of drama and the different types of drama. Obidiaba tried to get her attention with her usual antics and excessive show of fondness. Teacher ignored her. Obidiaba in order to rebuff peers' ridicule took it on Jessica for using the word "thriller" instead of "trailer" as the teacher corrected her:

*Obidiaba*: You are fond of using big words  
you don't understand (class laughs).

*Jessica*: Who told you I don't understand  
"thriller".

*Obidiaba*: I know you don't.

Jessica was embarrassed and started sobbing. Teacher shut Obidiaba down with "Joker, be serious". Teacher then called Agyei to read portions of the story they were discussing. Agyei read well with the right intonation but received mates ridicule that he was being affectatious as was the case of Margaret in School A.

The Integrated Science teacher was faced with the severe trial of not losing his temper with Obidiaba. She changed seats more than four times. Teacher pretended not to notice Obidiaba's truant behaviour. Jessica once again ventured to check Obidiaba:

*Jessica:* Obidiaba, stop roaming in the classroom!

*Obidiaba:* You again madam "thriller". You are using "roaming" instead of a simple word (laughs loudly but teacher says nothing).

In School B, "teacher-less" times revealed students in their true colours as observation showed:

The English teacher was not yet in class. Cecilia got up, went to the front and asked mates to open their English books to page 63 and that their teacher had instructed that they read. The assistant class prefect, a girl shouted at her to sit down as their English teacher was not even in school. The rest of the students shouted, "protocol", teasing her that she was trying to campaign to be nominated as the next school protocol. Some of the students decided to leave the classroom for the library. Agyei, nicknamed "controversial boy" closed the door and held on to it to prevent two girls from leaving the classroom. He shouted, "beg me before I will let

you leave". The two girls did and he let go the door handle.

In School C, observations showed similar actions as reported about student actions in School A and School B. For example, Baaba in School A and Obidiaba in School B had their counterpart attention seeker in the person of Omari who often changed his seat whenever someone was absent. In addition Omari often threw tantrums whenever mates contradicted him:

Omari was the first to finish working the calculations during mathematics lessons. He quickly called out the answer to teacher who praised him for being first to finish without first ascertaining the validity of the answer. A minute later, Annan got up:

Annan: Sir, Omari's calculator as usual is faulty. His answer is wrong. The actual answer is 0.933.

Class: Yes sir, Omari was wrong. He should buy a new calculator.

Omari became annoyed with mates and became moody for the rest of the period.

Omari's behaviour attracted the attention of the Technical Drawing teacher. It was becoming a cause of concern even though mates were used to him and did not allow his attitude to bother them:

During a lesson in Technical Drawing, Omari insisted that a mate's diagram put on the chalkboard was inaccurate and his was better so teacher should allow him to put his diagram on the board. Teacher insisted that Ofosu's diagram on the board was perfect. A student sitting behind Omari started laughing at him. Omari would have slapped him if he hadn't been quick to move away. Teacher then threatened Omari with thrashing if he didn't behave himself.

Observations in School C showed a very unusual behaviour of students. Majority did not acknowledge the teachers presence whenever they were late to class:

Social studies lesson was in progress. R. K. and Adade walked into the classroom late, failed to greet the teacher and sat down and joined in the notes-writing. Ten minutes or so later, Annan, Amankwa and Afful having missed the first 35 minutes of the two periods, walked into the classroom and sat down without a word to the teacher.

Generally, students in School C conferred with one another during class tests and did not see anything wrong with that. This was not the case in School A even though students were supportive of one another. Observations in School C showed several instances of such cases:

Technical Drawing test was in progress. Baffoe went to a mate to consult him openly without being discreet. The teacher gave him a warning. The student with whom Baffoe was consulting said to the hearing of the teacher, "class test is not exams". The teacher warned the two boys but the rest of them felt the same way as the two and were supportive of them. Several others conferred with one another and the teacher could do little about the situation.

2. Do healthy classroom peer interactions promote learning?

### ***Peer Interactions***

Interactions among peers in the three schools/classes were generally cordial with very few isolated cases of verbal conflict. Peers felt free to interact with one another on every subject imaginable but of course in the classroom interaction of peers was mainly on academic matters. Interviews of students revealed that there was a kind of bond that kept peers in one class together even outside the classroom in places such as the dining hall, chapel.

assembly hall and all other places where the whole school gathered. This bond was stronger in boarding schools. As observations showed the classes prayed for their members who were athletes or contestants in quizzes for success which would ultimately raise the images of those classes showing that the fellow-feeling at class level was stronger than that of the house level or even school level. The following were thoughts students in School A shared with the observer on peer interactions in their classroom:

- a) *Mavis*: I feel we are really united because when we meet each other outside the classroom, we quickly identify with one another, especially in the dining hall where we sit according to houses.
- b) *Awo*: In this class, we are all unique. We all have our weakness which make us bored with one another sometimes but we cope well with each other and we help each other in every way.

Generally, the students in School A displayed solidarity in studying together, in forming cliques and supporting each other academically and socially. Nonetheless, as observations showed four girls, Linda (class prefect) Margaret (known as "Oburoni pete"), Kyerewa and Asantewaa continued to be reserved in class for the rest of the observation period. Could this be attribute to peers' teasing, threats, and naming calling these were students who from all intent and purposes were active and cheerful at the initial stages of the observation.

In School C, students expressed similar sentiments about peer interactions in the classroom as those in School A:

- a) *Amoah*: We make the effort to help each other academically.
- b) *Duku*: Students who sleep in class during prep and lessons are made to stand up.
- c) *Annan*: We share ideas and discuss past questions
- d) *Osei*: We are a very close-knit class. We advise each other and move together even outside the classroom.



In School B, peer interactions were on academic as well as non-academic levels and as observations showed, peer interactions were in three categories namely boys and boys, girls and girls and boys and girls. Teasing was often the most typical of boy-girl interaction. Girls often showed solidarity among themselves and they were more supportive of each other than the boys were of one another. Nonetheless taking the class as a group, there existed among both boys and girls a co-operative spirit for their academic well being. The following were thoughts from boys and girls on peer interactions in their classroom:

- a] *Sule*: We try to have a good relationship with each other. We interact to help each other academically during school hours because we don't see each other often after school.
- b] *Obidiaba*: I know I am troublesome but my mates and friends do not get angry with me. They tolerate me because they all know I am a joker.

A student, who was interviewed about how he felt whenever his mates ridiculed him, had this to say:

*Que.*: Why do your mates giggle when a teacher calls you to answer a question?

*Konadu*: They laugh because I often make mistakes so they think I will make mistakes again.

*Que.*: Does it bother you when they start giggling as you attempt to answer teacher's question?

*Konadu*: No Madam. It doesn't bother me. I am used to that. They always help me by whispering the correct answer to me.

Observations showed there were more peer interactions during "teacher-less" times in all the three schools/classes. Students often grouped to do academic work, resorted to peer teaching and discussion of pertinent social and developmental matters. The following were typical examples of such peer interactions from the three school/classes:

### School A

The core mathematics teacher was absent so Baaba, the attention Seeker, took it upon herself to lead the class in a discussion on their study pals programme with a boys school. The study pal programme was to be carried out through the postage system. Baaba explained to the rest that a pal was expected to send a past question to another pal to be worked and posted back to her/him for marking and the cycle continued. One student got bored with Baaba's monopoly of the discussion and reacted:

*Jennevive:* You are giving too many suggestions.  
Give others the chance to contribute.

*Baaba:* Go ahead if you have a point to make.

Baaba was not perturbed at all by Jennevive's rebuke and she took over the leadership again. The students were faced with a problem. They had wanted the boys to write first to invite them for the study pal programme but they had not as yet done so. The girls expressed varied opinion on the issue:

*Abena:* Men have the responsibility of approaching women for their hand in marriage so the boys should take the initiative to invite us.

*Sena:* That was the usual practice some years back (she replies). Today women are proposing to men so we should write the boys after one week if we don't hear from them.

There was a general applause for Sena and the students decided to take her advice. Baaba who was still leading in the discussion, suggested they use nicknames in their initial introduction of themselves to the boys in order to maintain anonymity. She therefore asked every student to choose a nickname if they didn't already have one or be given one by her. Examples of nicknames were "Posh", "Mercedes", and "Sheba".

### School B

Peer interactions during one "teacher-less" time was most revealing with regard to students' anxiety about their academic work and social life:

The English teacher was still not back in school so Sule, the class prefect prevailed upon the mates for their co-operation in discussing their academic welfare. Pertinent issues raised were:

*Sule:* Our mathematics teacher has not been regular to classes and this same teacher rushes through lessons whenever we are doing mathematics. We should therefore send a petition to the head for a new teacher.

*Koranteng:* The school Librarian closes too early and we don't get access to the library when we are free. The library should be closed at the same time that school closes, 3:30pm.

All the students agreed to take up the matter with the school authorities. The class prefect suggested they take peer tutoring seriously because of the rampant absenteeism of teachers.

Others expressed misgivings about mates who often talked or wrote love letters during the peer teaching. The girls in the class appeared to be guilty of this offence so they reacted vehemently. The consensus was that peer teaching should be the temporary solution for teachers' absenteeism until a permanent solution was found. The issue of classroom sweeping was raised. The observation was one girl never swept when it was her turn to do so with others. Again the majority of the boys were not co-operative in that matter. Agyei the "controversial boy" immediately reacted to this:

*Agyei:* Let me ask you girls. In your houses who sweeps, your fathers or mothers? Don't you know that sweeping is women's job?

*Obidiaba:* Wait till you get married then you can ask your wife to sweep your house (replies Obidiaba). Here all of us are to sweep. Women have been to Beijing to talk about women's rights so "we no go sit down make you cheat us." (i.e. We will not allow you to cheat us)

There was pandemonium at that point but the class prefect started distributing test papers, which settled everybody.

### School C

The absence of the Physics teacher one morning afforded the students the opportunity to have a frank discussion on pertinent issues to be taken for redress at school council meeting scheduled for that week:

The school council representative for the class led the students in the discussion and not the class prefect. At a

point a student suggested that the discussion be deferred to the afternoon so that they do some academic work. The rest felt that what they were discussing would help them progress in their academic work. Students who were disturbing by talking in the course of the discussion were jeered at and they quickly joined in the discussion. The students raised the following points for discussion at the school council meeting:

- a] Certain teachers used insulting words on students, which made them dislike the teachers, and the subjects they taught.
- b] Saturday prep was ineffective without teachers' supervision.
- c] Students often wasted precious time for learning, waiting for their turn to work at the science resource centre. Times for the trips should therefore be adjusted.
- d] School field needed improvement. More games should be introduced.

### **Students Reflections on their Classroom as a social entity**

Observations showed that students in all the three schools/classes felt very much at home in their respective classrooms. Students had a healthy feeling about their classes. For example, in School A, the students of the observation class which was one of the five science classes in the school, felt they were the best science class and the next school prefect was sure to come from their class. Students in School C believed that the whole class would meet at Kwame Nkrumah University of Science and Technology (KNUST) for programmes such as Engineering, Architecture, Building Technology and what have you. This feeling of belongingness also led

Students in School A and School C engage in the practice of sharing encouraging thoughts every week. These thoughts were usually written on one corner of the chalkboard. The following were examples:

**School A**

**Food For Thought**

- a] "Beware and flee from ungodliness."
- b] "You are one special lady so be yourself."
- c] "Winning is not always winning and so is losing."
- d] "Create new memories by making the best out of every situation."
- e] "The dark continent has a lot to offer the world."

**School C**

**Thought for the Day**

- a] "Let your speech be better than silence, otherwise be silent."
- b] "The stone is heavy and the sand weighty but a fool's wrath is heavier than both"
- c] "You were born to be wise so be wise."

3. **How do peer relationships (e.g. peer victimisation, peer groupings, peer tutoring, peer acceptance and reciprocal friendship) enhance or impede classroom academic work?**

### Communication among Students

As observations showed, there was what might be termed a healthy give-and-take type of communication among peers in the selected classes. However, quiet or reserved students were often caught in-between this “see-saw” battle of wits between the opposing sides of active students, especially so in School A:

The Biology teacher in School A arrived at 11:40 am on time and immediately got down to business. The topic he wrote on the chalkboard was “Useful Microbes”. In the course of the discussion, students engaged in verbal wars with one another over the issue as to whether malaria is an infectious disease. What ensued was worthy of note:

*Linda:* Sir, malaria is an infectious disease because mosquitoes bite victims of the disease and carry the parasite to the next person through their bites.

*Sena:* I disagree with you Linda. Malaria is not an infectious disease because the blood each mosquito takes from the individual is not put in another victim.

Sena finally won over both teacher and classmates including Linda. Teacher however resolved the intellectual battle by stating that even though Sena’s argument was valid, from the biological definition given, malaria is an infectious disease.

Another scene which generated a healthy communication among students was whether microbes in human beings are a blessing in disguise:

*Jennevive:* I see mutualism at work here. For example microbes in human intestines act on undigested food to produce vitamins which are useful to humans and humans are also giving shelter to them.

*Kyerewaa*: Is that so? Jen, what about the lice in your hair (jokingly)?

The teacher plus the whole class including Jenneville roared in uncontrollable laughter, even the reserved students.

Some students were sometimes mandated by teachers to help mates who had difficulty understanding concepts explained by the teacher. In such cases, there was one-way communication from one student to the rest or the individual student with a problem or the rest of the students if it involves the whole class.

An interesting thing that the observer noted was that students just did not want to communicate on their test scores. Observations also showed isolated cases of unhealthy communication among students in the form of teasing or ridiculing as has been noted earlier in the "Oburoni pete" incident.

In School B, observation showed that there was more communication among students during "teacher-less" times. This was in the form of peer tutoring. There were very few intellectual combats and these were usually between boys and girls:

English lesson was in progress at 9:05am. The passage was about a priest. Students vehemently argued with one another as to whether the priest was brave or a coward. The girls insisted that he was a coward and the boys insisted he was brave. The teacher looked on for sometime and then shouted,

T: Hey! You are arguing without proof from the passage. Go back to the passage to cite instances to substantiate your point.

There was an undertone whispering of "he is brave", "he is a coward" until teacher finally resolved the conflict with evidence from the passage that the priest in question was a coward. Even after this resolution, the boys were still not



satisfied and continued arguing undertone that the teacher being a woman had sided with the girls.

In School C, observations showed the same healthy communication among students with very few exceptions. Teachers, especially Mathematics and Technical Drawing teachers often engaged students in group work which generated a “give-and-take” or two-way communication among students. However, one student, Omari, was often in conflict with mates. He just did not take kindly to mates contradicting him. The following were his thoughts about the issue when the observer interviewed him:

*Que:* why are you often in conflict with your mates over academic issues?

*Omari:* I feel bad when my answer to a question is wrong and they laugh or jeer at me.

*Que:* Are you the “always-win” type of person?

*Omari:* I don’t think so Madam, but I feel they intentionally pick on me by opposing my views. Anyway, I am not saying my answers to teachers’ questions are always right.

Obviously Omari was the sensitive type of person because students laughed at one another on such academic issues.

### **Summary of findings**

1. Unaccepted and victimized students were often subjected to peer teasing and ridicule and were therefore inhibited in their academic work through lack of interactions with teachers as well as classmates. A student who incurred the displeasure of peers (e.g. Linda, the class prefect in school A) could be victimized. Unaccepted students were often the notorious ones’ (Obidieba in School C) as well as the proud and boastful ones (e.g. Omari in School B).

2. Peer tutoring was a regular feature among peers in a classroom as a supplement to teachers' formal instructions; it was most regular during "teacher-less" times.
3. In single sex schools, both boys and girls were equally supportive of one another academically while in the co-educational school, girls were more supportive of one another than boys were of one another academically.

### **Discussion**

Authorities (Roger, 1972; Gage and Berliner, 1984; Agyeman, 1986; Sprinthall and Sprinthall, 1990), on the above-stated subject agree that just as the school in general is a social system so is the classroom. They submit that there are adolescent subcultures in the school in general and in the classroom in particular. For instance, Agyeman (1986) states that teachers must take note of the adolescent subcultures because the different groups have varying effects on the classroom dynamics. The effects may either be beneficial or detrimental to the teaching-learning process.

The case study which sought to examine classroom peer interactions in relation to the teaching-learning process revealed a number of findings which are consistent with other findings. The major findings with respect to the purpose of the study are as follows:

1. In single sex schools, both boys and girls were equally supportive of one another academically while in the co-educational schools, girls were more supportive of one another academically.

This finding is consistent with the finding of Kutnick, Jules and Layne (1997) in their case study, "Gender and School Achievement in the Caribbean". The finding of the present study is indicative that gender plays a role in the classroom peer interactions with respect to academic work in mixed schools. This could be the result of competition between boys and girls but where the school is either for boys or girls, both sexes tend to be supportive of each other.

2. Unaccepted and victimized students were often subjected to peers teasing and ridicule which made them

sometimes withdraw from academic activities (as seen in the case of "Oburuni pεε" in school 1).

The finding is consistent with the findings of Ladd and associates (1997). Their study has shown that the harassment or the embarrassment experienced by victimised children lead to pre-occupation with worries and withdrawal from group learning activities which in turn negatively influence academic work.

3. Peer tutoring was a regular feature among peers in the classroom as a complementary work to formal classroom instructions.

Perhaps subjects resorted to this in order to fill in the gap whenever teachers were absent. This explains the prevalent occurrence of peer tutoring in School B where teachers' absenteeism was rampant. The impact of peer tutoring on academic work in a competitive senior secondary system may be negligible compared to other factors which impact on academic work as earlier indicated.

### **Implications for the Practice of Guidance and Counselling**

The theoretical standpoint that classroom peer interactions can either enhance or impede academic work has been confirmed with the major findings from the case study. The large number of student population in the classrooms now can not be compared to the past. The numbers continue to swell up. Peer influence consequently continues to increase resulting in some negative peer relationships such as peer victimization. Teachers are unable to give the required attention to individual students as in the times passed and the majority of students are at the mercy of peers for academic support. Moreover, teachers are under pressure to prepare students for entry into tertiary institutions and at the same time are faced with the same economic pressures which make them look elsewhere for money to supplement their monthly salary. These and other factors explain the findings of the qualitative data namely popularity of peer tutoring, academic support from peers and the like.

The findings also call for teachers in the classrooms to recognize the value of peer groups (i.e. cliques) and the "stars"/group leaders in the classes and use them for effective academic work.

In the face of mounting pressures on teachers in the senior secondary system, the findings would promote the understanding of policy makers, school authorities, parents the need for organizing structured peer tutoring or even cross-age tutoring.

The present state of making teachers who are non-professionals counsellors need to be rectified by Ghana Education Service in order to have professional counsellors better able to help students handle peer relationships effectively and whose sole responsibilities are to render counselling services in the schools.

The findings call for the need for teachers to liaise with professional guidance and counselling co-ordinators in the schools for effective monitoring of students' peer relations with respect to academic performance.

School authorities would understand and realize the need for peer counselling in their quest for a panacea for the falling academic standards. The university counselling centres will come in handy in the training of students for the practice of peer counselling.

The use of sociometry for the purpose of identifying "isolate" or "victimise" students for counselling in the classrooms is crucial. For example, a teacher through the knowledge of the sociometric picture of the classroom could detect social "isolates" and thereby help them get integrated into the class group.

### ***Conclusion***

In the first place, the findings indicate that peer relationships do exist in the secondary school and they are important phenomena in the academic life of the adolescent. The findings go to conclude that peer relationships have significant link with the academic work of the students of the senior secondary school. These conclusions are in agreement with those of prior studies on both children and early adolescent peer relationships and academic work undertaken in the United States of America.

Thus, the researcher among other things recommends that policy makers, the Ghana Education Service (GES), school authorities, teachers, parents and students take a closer look at the issue of peer influence and redirect it to have positive impact on students' academic work in the quest for solutions for the current falling academic standards in the country's senior secondary schools.

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## **Tracing the Definition of Literacy and Making Out-Of-School Literacies Visible in Ghanaian Schools**

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### **Abstract**

This paper explores the changing definition of literacy to *literacies* and discusses how out-of-school *literacies* can be made to positively impact school literacy in Ghana and other communities. Recent research has shown that there are multiple literacies in addition to school literacy that individuals use to negotiate their lives as members of any community. Using published literature, the paper develops an argument that the definition of literacy has changed and that out-of-school literacy has a functional place in the development of school literacy in Ghanaian schools and schools elsewhere.

The traditional definitions of literacy have been considered largely to refer to reading and writing that are gained from school and school-related activities. The value of school and school-related reading comes from the traditional division of societies into oral and print societies and the common assumption that oral societies are less developed and civilized than print societies. Most Ghanaians describe people who cannot read and write in English as illiterates. Such designations do not take into account the concepts of multiple literacies and the issue of making out-of-school literacy as important as reading and writing. In recent times, the traditional definition of literacy has drawn attention to itself as a simple and ineffective way of defining the concept of literacy. It has been necessary for researchers and educators to review the definition of literacy because what it meant to be literate some years past is different from being literate in our contemporary world. Schools have changed, societies have changed and the practices for reading and writing too have changed. There is therefore the need for a careful look at the changing definitions of literacy so that schools can benefit from other forms of literacies.



### Defining Literacy Traditionally

Literacy has been defined traditionally as an ability to engage in the use of print and numeracy (Venezky, 1990); "the ability to decode and comprehend written language at a rudimentary level" (Kaestle, 1985); and as "mastery over the processes by means of which culturally significant information is coded" (Castell & Luke, 1983), among others. Most of these traditional definitions point to the fact that literacy is related to language. However, the link between literacy and language is always set to equate literacy to reading and writing, thus making print societies those that practise literacy. Goody and Watt (1968), in their classical essay on the consequences of literacy explain that the print and oral societies have different ways of processing literacy and that the print society is more literate because it has a way of transmitting history and culture by a permanently recorded version of history whereas the oral society transmits its history and culture by word of mouth. According to Goody and Watt, literacy is also linked to civilization because the print societies were able to record their past experiences that is why they were able to develop the alphabet and writing, a mark of civilization.

Ong (1982) also contends that oral societies did not engage in reading and writing because such societies permanently recorded thoughts, culture and history before using mnemonics and formulas to recall and retain thoughts. The oral tradition of storing information is therefore not seen as an activity of developed people. Kaestle (1985), however, explains that linking literacy to these concepts and drawing binaries between oral and print societies is only a concept projected by historians because historians created this image by linking literacy to democracy, technology, economic and circuit models. The historians also asserted that print societies read books, used technology and had a lot more economic power than the oral societies. This perception, that literacy is a practice of print societies, has created an image of print society as more developed than oral society, and defined literacy as basic reading and writing skills needed for development and civilization, thus investing print societies with some cognitive advancement.

Scribner and Cole (1981) question the speculations that there is a cognitive consequence that comes out of print and reading. They find no truth in the statement that reading and writing entail fundamental cognitive restrictions that control intellectual performance in various domains. The

explain that literacy is not just about reading and writing or English because literacy practices are created by social organizations. The authors assert that even in what is usually labeled as oral societies, there is some form of print. Their classic study of the Vai people of Liberia showed that the Vais used three different languages for different literacy practices. For the Vais, the various functions in the different languages served as literacy practices.

The example of the Vais shows that what the society, whether print or oral, creates as literacy practices carries values in those societies. The study of Scribner and Cole takes away the binaries that the historians in Kaestle's work put the two societies. Defining literacy in terms of reading and writing skills does not fully address the problem because there is a fundamental question of what reading and writing should be used for. If reading and writing are only for the sake of acquiring the skills, then there is a question with how the skills translate into civilization and development. The question of defining literacy answer to all the facets of language use has led many researchers to the use of metaphors to describe literacy.

As a way of moving from the single definition of reading and writing, literacy has been metaphorically explained as adaptation, power and a state of grace (Scribner, 1984); as economic capital and power (Bourdieu, 1977; Stromquist, 2002), as resource (Brandt, 2000) and as identity (Kramsch, 1998). Each of these descriptions is informed by particular motivations and orientations. But as Knoblauch (1990) says, what makes any definition of literacy powerful is the ability of the people to make literacy visible. Making literacy visible means bringing other literacies that otherwise may not be recognized as legitimate literacies to the fore of education and research.

### **Shifting Definitions of Literacy**

The need for a shifting definition of literacy is because the complex and diverse society of our contemporary times demands a new kind of knowledge and competencies that cannot be achieved only through the basic skills of reading and writing. Communication has changed to include advanced technological and media methodologies. Again, our changing societies have taken on different contexts for literacies other than school and there is the need to expand the definition of literacy to include these new developments (Barton & Hamilton, 2000; Kalantzis, Cope & Harvey, 2003; Gee, 2000; Street, 2004).

The multiple definitions of literacies or multiliteracies started with the New London Group, a group of scholars and literacy researchers that first met in New London in September 1994 to discuss the trends in literacy and pedagogy in relation to their special cultural backgrounds and needs. Their theory of multiliteracies indicates that there are multiple channels of communication, diverse cultures and languages that need to be incorporated into pedagogy in order for pedagogy to be representative (Cope & Kalantzis, 2000). "Multiliteracies" is used by the New London Group to refer to different multiple modes of meaning that have been redesigned from available historical designs of meanings to incorporate new and changing meanings from texts. It includes the multiple differences in communicative channels, the diverse nature of culture and languages, and the relationship between traditional meaning of literacy and broader meanings associated with the use of language and text.

The new definition of literacy therefore expands its meaning from the traditional definition to include other practices such as visual, audio-visual, and spatial patterns of meaning that originally were not thought to be literacy practices. In most of these new definitions, literacy has been described as a socially situated construct.

Barton and Hamilton (2003) define literacy as a social practice that is situated in times and places. They refer to literacy practices as cultural ways of using language; literacy events as activities where literacy has a role and involves text, and text as a key tool in any literacy. This social practice involves participants, setting, artifacts, and activities. For Barton and Hamilton, literacy changes over time and in different places, meaning each society has activities in different domains that it considers to be literacy practices. These domains may include school literacy, but that is not the sole domain for literacy. Heath (1983) explains that literacy is represented differently in different societies because the notions of literacy differ by different variables including race, social class, community, and even towns. Literacy therefore cannot be equated to how one group of people use language; thus, questioning whether the traditional definitions are tenable.

The New Literacies Studies group, which also came up due to the changing definitions of literacy also advocates redefining literacy as a social activity. However, they go further than the New London Group to include applying discourse analysis to the research. The main research focus for this group is a link between home and school literacies. Like the New London

Group, the New Literacies Studies group places literacy in a social context as a component of everyday social life of a given society, thus taking away the question of universality of reading and writing skills. Situating literacy in societies shows that literacy does not exist on its own as school-based skills, but it also exists in ordinary everyday lives of individuals and communities. In order for school literacy to be part of students' lives, there is the need to incorporate it into students' own cultures by learning how their cultures prepare members from childhood into adult literate life (Willinsky, 1990).

### **Adults as Sponsors of Literacies**

The concept of multiliteracies validates the diversity of different literacies and promotes the inclusion rather than marginalization. Expanding the definition of literacy to multiliteracies means including the practices and events of adults, which invariably are usually out-of-school literacies. In Ghana, such literacies would include the use of language in libation, for proverbs, folktales and even dirges.

Public and media descriptions of adults in most communities have mostly dwelt on adults as non readers (Hull, 1993). In Ghana, when educators talk about reading, they focus on students rather than adults. The reason why we do not concern ourselves with adult reading is that we perceive reading to be an activity for school. This perception does not account for other literacy practices that adults engage in. Adults engage in home literacy practices, community practices and events, church activities, and many other social practices where they use language and text (Brandt, 2001). If the definition of literacy has shifted to multiple and socially situated literacies, then educational researchers and the general public need to look at these areas too as domains for literacy practices and events because these domains are also capable of informing and shaping the lives and identities of the younger generation who are in school.

Research has shown that these same social domains provide a foundation for the child before the child even goes to school (Purcell Gates, 2000; Brandt, 2001). Brandt (2001) tells the stories of 80 Americans and how they gained literacy. The stories show that literacy is not gained from only school and that there are other institutions and people in the society who sponsor the literacy of others. Brandt defines sponsors as "any agents, local or distant, concrete or abstract, who enable, support, teach, and model.

as well as recruit, regulate, suppress, or withhold, literacy – and gain advantage by it somehow”. The sponsors, she continues may include “older relatives, teachers, religious leaders, supervisors, military officers, librarians, friends, editors, influential authors”, among others. If one looks at the list of literacy sponsors that she identifies in the lives of the people she studied, one can say that literacy learning is done in our everyday lives.

The sponsors she lists can be found in the ordinary daily lives of Ghanaian pupils and students, and the practices or events they engage in are most of the time not prescribed by school curriculum. Some years past, storytelling, riddles and other out-of-school literacies were on the school time table and teachers were obliged to teach them. In recent times these literacies have been relegated to the background and most of the time replaced with “examinable subjects”. The replacement does not take into account the issue of taking away the culture and social values that these out-of-school literacies inculcate in the pupils. There are different kinds of literacies at home, and the nature and content of these literacies come from the diverse cultural histories and languages that are valued in the home (Gadsden, 2002). These literacies are situated in the cultures of the pupils and the students in the Ghanaian schools.

Defining literacy as socially situated means we must make room for the recognition of other languages and cultures because homes are different, cultures are diverse and multiple languages exist in societies. This is one value of multiliteracies that Ghana should not overlook, especially because Ghana is such a multilingual country. Literacy includes people’s awareness, values, attitudes, feelings and social relationships (Street 2004), and home literacy practices are factors that inform these attitudes. For example, the culture of family, family values and family vocations are learned through apprenticeship at home. If home, family and intergenerational literacies are so important in the definition of multiliteracies, how can these literacies which are mostly considered out-of school literacies be made part of school literacy?

### **School and Out-of-School Literacies**

The shifting definition of literacy to multiliteracies is because literacies are embedded in families, cultures of societies and individuals. The question that comes up is why school literacy has become the literacy that is valued? It is because the traditional definition of literacy was based

on school literacy. The forgotten part about literacy is that through communal collaboration elders of most African countries, including Ghana, are able to sponsor the young ones to acquire the knowledge and skills that make them responsible members of their families and community (Miller & Vander Lei, 1990).

The family provides a foundational role for the child and so the child goes to school with a wealth of knowledge on how to use language (Gadsden, 2002; Sheridan, Street & Bloom, 2000). However, school does not continue with the development of this wealth of knowledge because most of the time, the family culture is not recognized by school. Family cultures and learning styles such as the use of story telling are sometimes described in deficit terms and the child is directly or indirectly made to believe that his or her home literacies are not worth learning or keeping. Both parents and children themselves have complex literacy goals, beliefs and values. In recent times, parents have not shown much enthusiasm in the practice of out-of-school literacies such as story telling in schools. Even the use of Ghanaian languages in school is frowned upon by most middle-class parents. Parent would want teachers to use English to teach even the lower classes although research has shown that if children are taught at the early ages in their own language they do better in school. However, some Ghanaian parents still believe that our cultural values should be taught in schools. If there is a complete break between home and school, then the child who should be prepared by school for the community, society, or home, may end up getting education that will not make him or her functional in these contexts.

Another reason why school literacy should be spiced with out-of-school literacies is that contemporary school literacy has been designed to focus on skills, standardized testing, grades, and other skill deterministic methods. School literacy has been designed to prepare children through a form of education that should give them certificates and grades. These are good skills to develop but they are not the only skills needed for real adult life. The question then is, how is school preparing students for lifelong literacy practices? Are students being taught to engage reading the way adults do in real life or are they reading canons for school literacy practices?

There should be a shift from this divergence to make both school literacy and out-of-school literacies work together for the good of the child. This is because cultural discontinuity between school and home affects

literacy learning of children. They end up gaining school literacy and losing their own culture, family vocation, and family values if school does not recognize these. On the other hand, if school literacy is taken out completely from other literacies, then children would keep to their home literacies and lose school literacy.

The focus on literacy as designed by school curriculum alone should shift to include what the society expects from literacy. According to Willinsky (1990), if society expects individuals to perform specific tasks for their personal interest or for society's gain, they should be taught the specific activities directly. In literacy learning, children are being taught to engage in literacy practices that will give them membership of their communities and these literacy practices should include what their communities do with language and text in addition to reading and writing. How literacy is used should be a determining factor in what goes into literacy programmes and not just the acquisition of universal skills.

Instead of creating a gap between literacies by the way we define literacy, the boundaries between school and home need to be taken out in order to encourage exchanges of cultural patterns and practices (Heath, 1983). Bridging this gap will minimize the differences between cultures and promote understanding among cultures. To make literacy a real social process in students' lives, as defined by the New London Group, students should be made to combine school literacy with multiliteracies from the community, home, church and from settings other than school so that they can go through the process of learning to be members of their communities.

Though the New London Group, the New Literacy Studies, and many more educational researchers have situated literacy in society, recent trends in literacy research is asking that literacy researchers and educators look beyond the "local literacies" to distant communities. The terms "local" and "distant" literacies, only bring out contemporary ideological societies in which literacies are situated. The changing technology and communication in the world coupled with new workplaces and industrial capitalism demands a critical look at literacy and new educational responses. The new basics in learning do not mean a change in multiliteracies but rather "a visible example of broader trends within the new economy which suggests the need for new orientations to knowledge" (Kalantzis, Cope & Harvey, 2004). These new discussions in recent research hint on the complexities in

defining literacy and how globalization is changing the definition. As Stromquist (2003) argues, globalization promises education in terms of its importance in everyday life in relation to acquisition of material production and life success and educators need to know that ideology plays a role in shaping education and the changing world. The shift in focus now goes to prove that the definition of literacy will keep changing with time and new experiences. Obviously, not every community is an equal participant in the globalization process. It is laudable that Brandt and others are redefining literacy to include global ideological influences. However, the tendency in drawing binaries (local versus distant) is to categorize concepts into set boxes of either . . . or entities.

### **Implications for Education**

Instead of expecting that school literacy should inform home, multiple literacies from other social domains, such as home, family and community too should be brought to inform school literacy.

In order for literacy to include both school and out-of-school practices, there should be a relationship between school and home literacies. Parents should be made partners of school. They should be invited to get involved in the literacy learning of their children in school so that they can provide cultural literacies that will act as funds of knowledge (Moll, 1992) and models for students. It gives confidence to parents if they are invited to take active part in their children's school and learning processes, knowing that their own literacies are valued. These visits of parents to classrooms will help teachers to understand and adopt alternative ways of teaching to reach all students. For example, storytelling and apprenticeship which are common practices in our Ghanaian culture can be used in collaborative learning.

Also, to help students to engage in lifelong literacies the school curriculum development should be informed by what adults read. There is the need to modify school curriculum to include forms of reading that students will grow up to use. For example, the print media, such as newspapers, advertisements, and other forms of literacies that adults engage in will be useful supplementary readers to the approved textbooks and other readers. Knowing that adults read for leisure, for occupation demands and for community socialization, teachers can help develop these reading skills in students by supplementing textbooks from media and popular culture.



They should also look beyond the community to see what distant ideological and power structures influence their literacy pedagogy so that they can deal with that without affecting what students learn. For example, advertisement is ideological and can be used to control the reader who is a consumer. Students should be taught how to read such material so that in their adult life they can make use of that literacy.

Furthermore, as an extended practice, educators and literacy professionals can work with school districts and libraries to emphasize the relative and lifelong nature of literacy. Students can then focus on reading and writing for social involvement rather than just for the reading to pass examinations.

### **Conclusion**

Looking at the shifting definitions of literacy, Ghanaians need to change their perception of what we consider to be literacy. We should move from defining literacy only in terms of school literacy. It also means schools should incorporate literacies that are based on out-of-school practices in the school curriculum. There are many literacy sponsors in most Ghanaian communities. Sponsors such as chiefs, elders, parents and knowledgeable adults can be invited into schools to communicate such practices to pupils and students. These adults could be used as resource persons for language practices that lead to lifelong literacy practices, for incubating cultural values and beliefs, for developing the culture of ethnic tolerance among students through providing them with knowledge on the cultural values of ethnic groups other than the students' own, as well as bridging the gap between school and home. The shifting definition of literacy to literacies makes room for these literacy events as part of the curriculum that are as important as the subjects that are examined as requirements for further educational pursuits.

Tracing the various definitions of literacy, one can say that literacy is not an isolated school-based skill of reading and writing (as defined by the traditional definitions) but a social process that involves everyday use of language and text in different settings (including schools), cultures and times. It is therefore more useful to define literacy in terms of multiple literacies.

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## **Influence of Socio-Economic and Prestige Factors on Career Aspirations of Secondary School Students in Ghana**

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### **Abstract**

The study examined the influence of some selected socio-economic and prestige factors on the career aspirations of secondary school students in Ghana. Variations in the influence of the factors on students' career aspirations based on their demographic characteristics were also investigated. Participants consisted of 1075 males and 1265 females (N=2340) randomly selected from 22 senior secondary schools through a multi-staged stratified sampling. A survey instrument with a Cronbach Alpha reliability coefficient of  $\alpha = 0.85$  was used. Data were analysed with percentages, mean, standard deviation and Analyses of Variance (One-way). Results revealed that socio-economic and prestige factors have high influence on students' career aspirations. Students' desire to help improve community life was reported as the most significant socio-economic factor that influences their career aspirations. Significant differences in the influence of socio-economic and prestige factors on students' career aspirations were reported in respect of school setting and school-type. Implications of the findings for counselling and human resource development are discussed. This includes the need for career counsellors to recognize the relevant socio-economic and prestige factors that influence students' aspirations in their career guidance sessions to enable them better assist their clients.

The process by which individuals select and eventually settle in specific occupations has been a subject of much interest in Career Guidance and Occupational Psychology. In this connection several theorists (Bandura, 1977, Crites, 1981, Holland, 1985, Gottfredson, 1996) have highlighted the forces that influence individual's career choice.

The sociological perspective of career development stresses the cultural, social, economic and other environmental determinants of career choice and aspirations. The theories that are classified under this category usually known as non-psychological theories of career/vocational choice attribute choice phenomena to the operation of some system which is external to the individual.

One prominent sociological perspective to career choice is the status attainment model (Hotchkiss and Borow, 1990). The status attainment model includes a focus on educational and occupational choices and, in part, investigates the influence of family background and parents, friends, and

relatives and those choices. The model also considers the influence of career expectations on career attainments.

This relatively simple attainment model has stimulated an enormous amount of empirical research (Sewell and Hauser, 1975; Alexander and Eckland, 1975; Hauser, Tsai, and Sewell, 1983). Despite strong empirical support for the status attainment model, it has come under criticism for providing only a partial account of status attainments. Many sociologists argue that the model is incomplete. According to the critics, "the most important omission from the model is an account of how social structures such as rules of access to jobs, salary schedules, job security, and performance standards – interact with individual characteristics to influence socioeconomic outcomes of individuals" (Hotchkiss and Borow, 1990; p270).

Another sociological perspective on career choice and development is the economic theory of schooling and competitive market (Hotchkiss and Borow, 1990). One aspect of the economic theory which is of relevance in this study is the human capital theory. Human capital theory is developed around the analogy that individuals invest in their own productivity in a manner similar to the way investments in physical capital are made. Investments include direct outlays for educational cost and foregone earnings during the period of investment (for example, period of college attendance) (Becker, 1975; Mincer, 1974). Individuals differ in preferences and abilities, and each person makes investment decisions so as to maximize discounted lifetime earnings. This means individuals are interested not only in their future earnings. An increasingly important aspect of the human capital approach is that individuals make career choices regarding amount of schooling, type of schooling, and occupation that are optimum for themselves (Hotchkiss and Borow, 1990; Willis and Rosen, 1979; Heckman and Sedlacek, 1985; Lang and Dickens, 1988); that is, individuals make rational decisions to match their own profiles with features of jobs and occupations.

Status tends to influence the knowledge and understanding which youth have of different occupations (Rice, 1984). Rice further reveals that middle class parents are more able than working class parents to develop broad vocational interests and an awareness of opportunities beyond the local community. The socially disadvantaged adolescent has seen less, read less, heard less about, and has experienced less variety in his environment in general, and simply has fewer opportunities than the socially privileged

person. Another non-psychological theory of career aspirations and development is the social learning theory of career decision-making (Krumboltz, 1979; Mitchell and Jones, 1976). This theory is an outgrowth of the general social learning theory of behaviour, which is most often associated with the work of Bandura (1977). The social learning theory assumes that the individual personalities and behavioural repertoires that persons possess arise primarily from their unique learning experiences, rather than from innate developmental or psychic processes. The social learning theory of career decision making is designed to address the question of why people enter particular educational programmes or occupations, why they may change educational programmes or occupations at selected points in their lives, and why they may express various preferences for different occupational activities at selected points in their lives.

As a result, low socioeconomic status boys are inclined to take the only job they know about at the time they enter the labour market. The same principle applies to girls (Shertzer, 1985).

According to Grigg and Middleton (cited in Rice, 1984), the total socioeconomic and cultural background of youths influences their job knowledge and their job preference. Furthermore, local variations in occupational choice tend to correspond with variations in the economic structure: the larger the proportion of persons employed in a particular kind of job in a city, the larger the proportion of youths who desire to go into that occupation. Also, whether an adolescent lives in a rural or urban environment is a factor in vocational choice. Urban boys have been observed to have higher occupational expectations than rural boys (Sewell and Orenstein, cited in Rice, 1984).

Adolescents also say they want to go into an occupation simply because it sounds glamorous, or it has high prestige value (Rice, 1984). A cursory examination of occupational prestige data reveals that some jobs are more prized than others (Featherman and Hauser, 1976). According to Shertzer (1985), many systems have been proposed for grouping occupations by socioeconomic factors. He observes that standards often used include the intelligence, skill, and education required for each occupation. Most of the systems classify occupations on an inferior-superior basis. The most widely known socioeconomic classification system is that proposed by Edwards and cited by Shertzer (1985). He suggested the

following classifications: Professionals; Proprietors, managers and officials; Clerical and kindred workers; Skilled workers and foremen; Semiskilled workers; and Unskilled workers (Farm workers, labourers, servants).

Classification system based on how people outside the occupation rank it is called prestige or status classification system. These systems are usually closely related to socioeconomic classifications. Some of the elements that seem to determine the prestige of an occupation are the amount of money earned, the amount of education required, the amount of power and influence exercised, the extent of manual labour performed, and the security provided.

Apparently the influence of socio-economic factors on the career decision making of individuals is critical. This has stimulated a number of studies world-wide. Unfortunately, very little seems to have been done in this area by way of research investigations in Ghana. This study was designed to fill this research gap. To this end, the current study examined the extent to which socio-economic and prestige factors impact on the career aspirations of secondary school students in Ghana. Specifically, it examined:

- the prominent socio-economic and prestige factors that influence students' career aspirations; and
- the variations in the influence of the socio-economic and prestige factors on students' career aspirations based on their demographic characteristics.

### **Methodology**

#### **Participants**

The study was a national survey and in order to make the sample have a national representation, steps were taken through appropriate sampling procedures to ensure that students from different parts of the country were included. A sample size of 2861 was obtained for the study from 22 public Senior Secondary Schools through a multi-staged stratified random sampling. Out of the initial sample, 2340 produced valid and useable completed instruments. These participants consisted of 1075 (45.9%) males and 1265 (54.1%) females with a residential status composition of 1853 (79.2%) boarding and 487 (20.8%) day students.

The minimum age of respondents was 16 years with 25 years being the maximum. The mean age for the group was 18.2 with a standard



deviation of 1.1. Of the 2340 participants, 1393 (59.6%) were from urban schools, 656 (28.0%) were from schools in small towns and 291 (12.4%) from rural schools. Settlements classified as 'rural' had population less than 5,000; 'small towns' had population between 5000 and 50,000 whilst urban areas had more than 50,000 inhabitants. On the basis of school-type, 1621 (69.2%) of the respondents were from mixed schools whilst 430 (18.4%) and 289 (12.4%) were from 'girls-only' and 'boys-only' schools respectively. The ethnic composition of the respondents were as follows: Ashantis (28.4%), Fantis (20.6%), Balsa/Frafra (22.2%) and others (28.8%).

### **Instrument**

One set of survey instrument was designed by the researcher to collect data from the sampled students. The instrument consisted of four parts. Part one contained twenty items that collected data on the demographic characteristics of respondents. Part two elicited information from students on the profession they would like most to enter after completing their education. They were asked to state and describe in an open-ended form their most preferred occupation. Part three of the instrument consisted of an 11 – item likert – type scale which measured the influence of socio economic and prestige factors on students' career aspirations. Students were made to indicate the extent to which they agreed or disagreed to the suggestions that some particular socio economic and prestige factors influenced their career aspirations. The gradation provided were: no opinion: 0, strongly disagree: 1, disagree: 2; agree: 3; and strongly agree: 4. The scale had a Cronbach alpha reliability coefficient of  $\alpha = 0.85$ .

### **Procedure**

The administration of the questionnaire was done either in the classrooms of the students or the school's assembly hall. The selected students were asked to stay in their classrooms, where appropriate, or were organized in the school's assembly hall and the questionnaire given to them, and the purpose of the study was explained. There was a 93.2 per cent return rate of the questionnaires.

### **Data Analysis**

The data were statistically analysed with the SPSS 10.0 format. Frequency distributions, percentages, means, standard deviation and

Analyses of Variance (one-way) were used to analyze the data. The alpha level of .05 was used in decision making. Post Hoc test using Scheffe and Tukey for multiple comparisons were also applied where appropriate.

A mean score was obtained for each of the statements on a five-point scale. The codes used were strongly agree -4, agree-3, disagree - 2, strongly disagree - 1, no opinion - 0. For reporting scores and carrying out analyses, participants who responded 0 to an item were removed from consideration with the assumption that a "No opinion" response is equivalent to an omit. This effectively made the five-point scale a four-point scale (strongly agree - 4, agree - 3, disagree - 2, strongly disagree -1) and caused some slight fluctuations in the sample sizes across results. Mean scores of 2.6 and above suggested agreement with a given statement and mean scores of 2.4 and below suggested disagreement with the given statements. Mean scores of between 2.41 and 2.59 indicated a neutral or uncertain position. These analyses helped to compare the extent to which the various groups of students accepted or rejected the suggestions about the influence of the various issues in the scales on their career aspirations.

Discussion on the frequency distribution of the responses makes the assumption that a combination of the multiple categories of the five point Likert-scale into three categories: Agree (strongly agree and agree), No opinion, and Disagree (strongly disagree and disagree) presents a clearer picture of the pattern of the responses.

## **Results**

### **Prominent socio-economic and prestige factors that influence students' career aspirations**

Table 1 shows the summary of descriptive statistics on the responses (n=2340) of students to some socio-economic factors that influence their career aspirations. Students generally agreed (strongly agree and agree) that all the socio-economic factors listed in Table 1 had some influence on their occupational choices. The factor that was most popular with students was the one which suggested that they chose their preferred occupations because they "like helping to improve community life" (54.0% strongly agreed, 38.4% agreed; n=2288, mean=3.4878). This was followed by the belief that their chosen occupations will help them live comfortable life (49.1% strongly agreed, 42.5% agreed, n=2305, mean=3.4108) and the perception that people have a lot of respect for their chosen occupations

(49.7% strongly agreed, 37.6% agreed; n=2301, mean=3.3620). The view that the occupations the students were aspiring to enter would help them avoid prolong employment was also highly rated (Table 1). However, the suggestion as to whether students' aspirations towards their chosen occupations were motivated by monetary attraction did not receive that high rating.

Table 1: Descriptive Statistics on Students' responses to some Socio-economic and Prestige Factors that Influence Career Aspirations

Factors	N	Mean	SD
People have a lot of respect for the work	2301	3.3620	.7597
I will become important in society	2235	3.0828	.8738
I like to improve community life	2288	3.4878	.6279
I can make a lot of money	2275	3.1116	.8429
It has good working conditions	2250	3.3400	.7588
Community needs workers in the profession	2220	3.2698	.7873
It has a high prestige value	2254	3.2848	.7422
I have heard a lot about the work	2256	2.8555	.9133
I have read and learnt a lot about job in books	2284	3.2947	.7402
It will enable me live comfortable life	2305	3.4108	.6705
It will help me avoid prolonged unemployment after school	2242	3.2868	.7780

#### **Demographic differences in the influence of socio-economic and prestige factors on students' career aspirations**

The study investigated the distribution of the responses of students (n=2340) by gender on socio – economic factors that influence career aspirations. Significant gender difference in opinion at .05 level of significance was obtained on the item “I can make a lot of money” (Table

1). An examination of the frequency distribution of the responses to the item referred to above reveals that a higher proportion of male students (80% agreed or strongly agreed) presented stronger opinion on the item than the female students did (75% agreed or strongly agreed). The mean scores of responses of the students (male:  $n=1036$  mean=3.1651; female  $n=1239$ , mean=3.0670) confirmed this observation. It would appear that pecuniary motive as a factor of influence in the career choice of students is more important to male students than female students.

Significant gender differences in opinion were also recorded on the items "I will become important in society" and "it has a high prestige value". The male students reported higher mean values than the female student did on both items. This implies that gaining prestige and social recognition are more important to male students than female students. Computation of One-way ANOVA on the combined responses to the items in Table 1 however, revealed that there was generally no significant difference between the male and female students in their opinions on the extent to which socio-economic factors influence their career aspirations,  $f(1, 2336) = .123, p=.726$  (Table 2).

The study further examined the distribution of responses of students ( $n = 2340$ ), by their school settings, on socio – economic factors that influence their career aspirations. Computation of One-way ANOVA from the combined responses to the items in Table 1, revealed that generally the views expressed by students on the extent to which socio-economic factors influenced their career aspirations did vary with school settings,  $f(2, 2335) = 3.290, p=.037$  (Table 2).

**Table 2: One-way ANOVA results on the Perceived Influence of Socio-economic and Prestige Factors on Students' Career Aspirations**

Variable	Source	SS	DF	MS	F	Significance
Gender	Between	4.406	1	4.406	.123	.726
	Within	83483.660	2336	35.738		
Residential Status	Between	62.458	1	62.458	1.746	.186
	Within	83425.608	2336	35.713		
Age	Between	189.760	5	37.952	1.062	.379
	Within	83298.306	2332	35.720		
School Setting	Between	234.617	2	117.308	3.290	.037
	Within	83253.449	2335	35.655		
School type	Between	856.295	2	428.147	12.09	.000
	Within	82631.771	2335	35.388	9	
Usual place of residence	Between	74.504	2	37.252	1.043	.353
	Within	83413.561	2335	35.723		
Ethnic group	Between	262.180	7	37.454	1.049	.395
	Within	83225.885	2330	35.719		

One other area of interest in the study was to examine the distribution of the responses of students ( $n=2340$ ), by their school type, on socio – economic factors that influenced their career aspirations.

One-way ANOVA computed from the pooled responses to the items in Table 1 proved that significant difference existed among students from the different school-types in their views on the extent to which socio-economic factors influence their career aspirations,  $f(2, 2335) = 12.099$ ,  $p=.000$  (Table 1). Follow up tests using Scheffe and Tukey tests for multiple comparisons revealed that the actual difference was located between mixed school students and students from girls' schools with a mean difference of 1.5296 significant at .05 level.

The study also examined the responses of students ( $n= 2340$ ) by their residential status, size of settlement where they usually reside, age and ethnic background on socio-economic factors that influence their career aspirations. These variables, however, did not prove to be significant determinants in the variations in the influence of socio-economic factors on students' career aspirations (Table 2).

### **Discussion**

The study revealed that socio-economic factors strongly influence the career aspirations of adolescent secondary school students in Ghana. Bell and Staw (1989) have pointed out that although people may have some choice about the career they follow, this is influenced significantly by their surrounding social and economic conditions. Individuals may be directed or attracted to a certain career by their individual skills and qualifications, or by environmental factors such as social class milieu, culture and race (Dalton, 1989; Derr, 1986; Nicholson and West, 1989; Thomas and Alderfer, 1989).

Studies conducted elsewhere indicate that socio-economic status tends to influence the knowledge, understanding, vocational interest and aspirations of the youth (Rice, 1984; Shertzer, 1985). The findings from this study indicate that socio-economic factors have great influence on the career aspirations of Ghanaian youth as well. The result of this study is therefore consistent with these earlier studies.

It is significant to note that the prominence received here by students' desire to improve community life is consistent with the acceptance they gave to the item under "work values" which suggested that their chosen jobs would give them the chance to help others (Ocansey, 2005). It would seem then that the desire to assist others and so help improve community life is cherished by most Ghanaian secondary school students.

Further more, the desire to enjoy the prestige one's occupation provides appear to be very important to Ghanaian youth. Rice (1984) has emphasized that many adolescents say they go into occupations simply because of its prestige value. It is interesting to note that the social prestige level rating of occupations by students has some relationship with their choice of occupations as revealed in the study by Ocansey (2005). Occupations such as Medicine, Accounting, Engineering and Journalism, which had high prestige rating, attracted relatively higher proportions of respondents as the targets of their career aspirations than other occupations did.

The instrumental value of an occupation to provide comfortable life for its practitioners was also reported to be a strong motivating factor in the choice of occupations by Ghanaian students. The standard of living in Ghana is generally low and most of the respondents in the study apparently had low socio-economic background. It is not surprising therefore that the

desire to achieve comfortable life through their future careers is very prominent in the mind of many Ghanaian students.

It is, however, interesting to note that pecuniary motive for the choice of occupation was not given as high prominence as was given to other items in the scale. That item placed ninth in order of popularity. This implies that the students recognise or belief that the desire for money should not necessarily always be the first consideration when it comes to career choice. One could live a comfortable life without necessarily having a lot of money.

The desire to avoid prolonged period of employment after school also proved to be a quite strong motivating factor in the choice of the kind of occupations students had targeted to enter. This implies that students' career aspirations were generally towards those career fields they felt quite certain that they could enter without much difficulty. The problem of unemployment among the educated is increasingly becoming a major problem in Ghana (UNDP, 1993). It is gratifying that the youth in school are becoming aware of this problem and are taking the necessary precautions to avoid the pain, frustration and agony the situation brings about.

In examining the differences in the influence of socio-economic and prestige factors on the career aspirations of students with respect to their demographic characteristics, the study revealed that no significant differences existed in the influence on the basis of students gender, age, ethnic background and their usual places of residence. The school-type and school setting of students, however, predicted significant differences. Students from mixed schools reported the strongest impact of socio-economic factors on their career aspirations. This was followed by students from all-boys school and then those from all-girls schools. Some studies (Sax, 1992; Vega, 1990; Swanson and Woike, 1997) have shown that socio-economic factors that influence the career aspirations of females may vary from that of males and that socio-economic factors such as money and prestige appear to be more salient for men than women in their career choice. This is consistent with the findings in this study and it may explain why there was a difference between the extent of influence of socio-economic factors on the aspirations of students from "all-boys" and "all-girls" schools. What is intriguing is why the students in the mixed schools reported the strongest impact of socio economic factors on their aspirations. Perhaps, the mixed school environment provides a semblance of real life

situation where issues like prestige, power over others, and financial strength are of much importance in determining one's position in society. This could account for the profound emphasis students in mixed schools placed on socio-economic factors in making their career choice.

### **Implications for Counselling and Human Resource Development**

The findings of the study has re-echoed the influence of socio-economic and prestige factors in the choice of occupations by the youth, especially those in Ghanaian secondary schools. Career counsellors and other human resource development (HRD) officers may have to consider this in their career guidance sessions with the youth. Counsellors and HRD officers may have to isolate or determine the various socio-economic and prestige factors impinging on the career aspirations of their clients to enable them better assist those clients in their career choices.

The desire to help improve community life came up as the single most important socio-economic motivator for students' career aspirations. Career counsellors and other HRD officers are challenged to help nurture this feeling in students for full implementation in their adult years. Guidance programmes which will evoke and harp on the patriotic feelings of students could be organised regularly for students. Students could be constantly reminded of the benefits individuals and society as a whole will gain when the collective effort of people in a community leads to overall national development.

The prestige value of some occupations was reported to be a strong incentive for students' desire to be in those occupations. Following this, it might be necessary for career counsellors and other HRD officers to assist students who aspire into those perceived prestigious occupations to do some self-analysis to determine whether or not they have the requisite aptitudes and other personality characteristics that will enable them function effectively in those occupations. Appropriate individual inventory service could be offered to such students to enhance their self awareness and to determine their suitability for those occupations. It may also be necessary to determine the relevance of those occupations to national development. Again, students could be assisted to determine whether or not the labour trend in the country favours additional production of labour for those perceived prestigious occupations.

The threat of graduate unemployment is real in Ghana and respondents in this study indicated some awareness of the problem. HRD



officers may have to instil entrepreneurship skill in the youth to equip them for self-employment. This may help ease the apparent anxiety students have with respect to their future employability. Relevant workshops, seminars, and symposia could be organised for students and the youth in general to help achieve this goal.

Variations in school setting and school-type predicted differences in the impact of socio-economic and prestige factors on the career aspirations of students. School counsellors are alerted and encouraged to consider these variables in order to meet the needs of the different categories of students to whom they provide career counselling.

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## **The Effects of Peer Observation and Intervention on Teacher Effectiveness in Ho Polytechnic**

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### **Abstract**

The purpose of the study was to assess the extent to which peer observation and review of teaching can be effective in Ghanaian tertiary institutions. Twenty academic staff and 300 students from Ho Polytechnic participated in the study. The study was one group pretest-posttest design. The treatment involved teaching, peer observation and discussions. An observation guide and interviews were used to collect data. An alpha level of 0.05 was used for all statistical tests. The results showed that lecturers increased the number of class assignments they gave and provided timely feedback to students. Lecturers also became more accessible to students and showed more preparedness to work with students. The lecturers who participated in the study found feedback from colleagues extremely useful. It is recommended that Ghanaian tertiary institutions give peer observation and review of teaching attention on their campuses.

Peer observation of teaching is essentially a one-on-one activity where colleagues observe each other's performance in teaching and learning with a specific focus and provide feedback. It is also regarded as an "intentional process of gathering information and evidence about the effectiveness of the teaching and learning process and the educational environment with a view to subjecting it to constructive criticism" (Flinders University, 2002, p. 1). Peers are a valuable source of input in the educational enterprise and their contributions to improvements in the quality of education should not be underestimated.

The National Association for Teachers in Further and Higher Education (NATFHE) (2002) in the UK noted that:

Peer review and observation is a process whereby a third party observes, and provides feedback on teaching and learning support taking place in a university or college. Its purposes are to strengthen and enhance the quality of

teaching and learning by providing feedback to the staff observed, to provide opportunities for staff to learn from each other, and to assist with staff development. The first guiding principle of observation should be that it is developmental rather than judgemental (p. 1).

Bradley (1996) underscored the appropriateness of a continuous approach to staff development through careful evaluation and monitoring by peers who as well learn from the experience of others. He stated that "the use of a 'critical friend' to provide a second perspective of our work - talking with us at the planning stage, occasionally observing us teaching or sharing teaching with us, taking an active part in evaluating whether we have achieved the degree of success we planned - has been shown to be very useful aid to self-evaluation" (p. 5). Blackwell and McLean (1996) further discovered that observation of teaching has been central to the methodology of Teaching Quality Assurance (TQA) introduced by funding councils in England. They revealed that peer observation has been seen as a tool for combating the problems of ensuring quality in the wake of expanded responsibility and dwindling funding levels hence the accelerated pace of introducing developmental observation and feedback on teaching from mentors.

Blackwell and McLean (1996) believed that peer observation of teaching provides a relatively unthreatening way of addressing the quality problems in education since it is an activity that takes place between colleagues in an established academic unit, where clear aims and objectives are agreed upon and relate to improving teaching through reflection. They claimed that peer observation of teaching provides reassurance through positive feedback to staff as it provides feedback on innovations and reveals hidden behaviour and thus encourages staff or enables staff to rectify the problem by extending the sense of enquiry and curiosity that drives much of the best research into teaching and stimulating critical reflection on teaching performance. Duke (1992), Brown and Sommerlad (1992), both cited in Blackwell and McLean (1996), were convinced that peer observation of teaching could emerge as a key component of continuing professional development for all academic staff, enable collective reflective practice to become a realistic target for universities and contribute to the creation of a 'Learning University'.

Gosling (2002) distinguished three distinct models of Peer Observation and Review of Teaching (PORT). These were (a) a management/performance model, (b) a developmental model and (c) a peer review model. The management model uses senior staff to observe other staff with the purpose of identifying underperformance, confirming probation, appraising, promotion, quality assurance and assessment. The developmental model uses educational developers to observe practitioners or uses expert teachers to observe others in the department with the purpose of demonstrating competence or improve teaching competencies. The peer review model uses teachers to observe each other with the purpose of engaging in discussions and teaching and for self and mutual reflection.

The third model, peer review model, is the model of choice for this study. This model was chosen because the primary purpose of the study was to assess the extent to which peer observation and review of teaching can enhance teaching and learning as well as promote personal growth through discussions as colleagues observed each other. Hutchings (1994) suggested four reasons why peer review of teaching is important. In the first place, student evaluations of teaching cannot account for certain substantive aspects of teaching. Only lecturers with appropriate knowledge can evaluate such aspects. Secondly, since teaching entails learning from experience, collaboration among lecturers promotes educational improvement. Thirdly, peer reviews lead to respect for the profession. Fourthly, peer reviews put lecturers in charge of the quality of their work. Braskamp and Ory (1994, p. 202) stated that "Peer observations are particularly useful in a program of faculty self-assessment and improvement. Instructors who wish to analyze their own teaching and student learning can benefit from a colleague's observation. Such classroom observations can be flexible and informal."

Peer observation and review of teaching has been practiced in Europe, USA, Australia and New Zealand with success. In Australia, Bell (2002) reported that there is evidence from the Universities of Monash and Wollongong that peer observation of teaching has been a learning activity for teachers. She reported that there "is a great deal of anecdotal evidence that peer observation improves teaching and develops collegiality and effective practice" (p. 8). In New Zealand, the Waikato Institute of Technology's Professional Development Unit and the University of Auckland's School of Engineering carry out peer observation (Bell, 2002).

After going through a peer review session, Hsu (2002) from the University of Maine, USA, commented that:

I have found both the encouragement and critical suggestions by the observers useful in helping me work out my practices. Thus, I felt encouraged to continue working with students in helping them think through the mathematics that they are learning and doing while I became more careful in weighing how much time I could spend in drawing students into a discussion versus the time I would need for new topics. (p. 3)

In the USA, D'Andrea (2002) reported that peer review of teaching developed in response to several demands on higher education. These demands included (a) public perceptions that undergraduate education was a low propriety in universities and in need of added emphasis, and (b) dissatisfaction with the evaluation of teaching which was based primarily on student evaluations of teaching.

Peer Review of Teaching was boosted in 1994 in the United States of America when the American Association of Higher Education (AAHE) obtained funding for the project, "From Idea to Prototype: the Peer Review of Teaching". The major outcomes of this project were:

1. Expanded possibilities for collaborations and review of teaching by scholarly peers;
2. New genres and prototypes for capturing the scholarship in teaching;
3. Changes in teaching strategies employed, in particular increased use of active learning methods;
4. Changes in campus policies, practice and culture around teaching; and
5. National conversations on campuses and in scholarly communities about Peer Review Teaching.

In the University of Texas at Austin, peer evaluation of teaching is an essential part of a faculty member's promotion and tenure file. Peer observation is one part of the evaluation of teaching for improvement or for personnel decisions for merit, promotion and/or tenure.

In Ghana, the practice of peer observation and review of teaching has not been given much attention in higher education. Though the practice of peer observation and review of teaching has been used extensively in African countries such as Kenya, Nigeria and Tanzania, it can be concluded that the practice is not considered a useful part of teaching and learning in Ghana. This study, which is a preliminary one, was an attempt to bring to the fore the important role peers can play to further enhance teaching and learning in higher education. The main purpose therefore is to assess the extent to which peer observation and review of teaching can be effective in tertiary institutions in Ghana. Specifically, this preliminary study attempted to answer the following questions:

1. What is the effect of peer observation on a lecturer's commitment to teaching?
2. What is the effect of peer observation on a lecturer's general style of teaching?
3. What is the effect of peer observation on a lecturer's assessment of student progress?
4. What is the effect of peer observation on lecturer-student relationships?
5. What is the opinion of lecturers on the introduction of peer observation of teaching as a means of staff appraisal?

### **Method**

#### **Participants**

Four out of 10 departments were purposefully selected and used in the study. From the four departments, 20 academic staff members took part in the study. Within these 4 departments were 29 lecturers. Nine of the lecturers did not take part in the study for undisclosed reasons and reasons such as unpreparedness, personal, pressing issues and unwillingness to be observed. The Departments of Accounting, Marketing, Secretaryship and Management Studies provided the lecturers. These academic departments were selected because one of the co-authors taught in these departments.



The co-author therefore possessed adequate knowledge of the content of most of the courses and how they ought to be taught.

Three hundred (300) students were selected to take part in the study. These students consisted of 45% in each class observed and selected through stratified random sampling as follows: (a) Above average students (15%), (b) Average students (15%) and, (c) Below average students (15%). The categorization became crucial in enhancing reliability. It was believed that overweighting the views of one group of students could jeopardize the validity and reliability of the findings.

### **Research Design**

The study was a one-group, pretest-posttest design. In this design, a single group is measured or observed not only after being exposed to a treatment but also before the beginning of the treatment (Fraenkel and Wallen, 2000). In this study, students responded to an observation guide on staff appraisal as a pre-test. Teachers then taught and were observed by peers. After each observation, a discussion took place on the teaching observed. The teachers taught again and the students responded to an observation guide as a post-test. The main purpose was to examine the effect of the treatment on the lecturers' teaching performance. Best and Kahn (1998) identified five major threats to internal validity with respect to this design as history, maturation, testing, instrumentation and interaction of selection and maturation. However, the data collection procedure greatly minimized or removed the effects of these threats. Dependent samples (paired sample) t-test was used in the data analysis with a 0.05 level of significance.

### **Instrument**

A twenty-six item classroom observation guide was constructed and used. The observation guide was made up of five parts. These included (a) commitment to teaching with 2 items, (b) competence in subject matter with 3 items, (c) general style of teaching with 16 items, (d) assessing students' progress with 2 items and, (d) relationship with students with 3 items. A three-point scale of adequate (given a value of 1), inadequate (given a value of 2) and not at all (given a value of 3) was used. Content validity evidence was obtained through expert judgment done by a University of Cape Coast

lecturer in Educational Measurement and Evaluation. Cronbach's alpha of 0.93 was obtained as an estimate of the inter-observer reliability.

The observation guide was designed to guard against appraisers trying to play safe by adopting a mid-way position, halo effect and the making of statements that cannot be substantiated. Columns were provided for evidence and remarks, which demanded proofs for, and reasoning behind each performance rating from the assessors.

### **Procedure**

Discussions were first held with the Principal and Vice-Principal of the Ho Polytechnic on the objectives of the study. When the approval was granted, further discussions were held with the heads of the departments involved in the study and the entire academic staff of the polytechnic. Students from the departments selected for the study were also briefed on the objectives of the study and the role they would play.

Academic staff in the four departments was consulted on their participation in the study and twenty accepted to be part of the study. The observation guide was shown to them and they were briefed on how to complete them as self-appraisers. Students were also trained on how to complete the observation guide with explanatory notes for their guidance.

A schedule, consisting of date of observation, time of observation, class to be observed and the subject to be observed, was developed in consultation with the 20 lecturers. At the appointed date and time one of the co-authors, went to observe. Each of the 20 lecturers was observed on two different occasions (pre-intervention and post-intervention). In all cases, whole lessons were observed. These lasted for three hours. However, in very few cases, two- and one-hour lessons were observed. The study was carried out within one semester of three months.

At the end of each lesson, a time was agreed upon for post-observation meeting. The minimum period for the post-observation meeting was forty-five minutes while the maximum was seventy-two minutes. During the meeting, which was held in a congenial atmosphere, the results of the observation were discussed. Areas that were well handled were congratulated. Actions that need to be taken to improve upon other areas were also listed.

### Results

1. What is the effect of peer observation on a lecturer's commitment to teaching?

Lecturer's commitment to teaching was assessed by two items on the questionnaire. These items related to the lecturer's regularity and punctuality in class. Information was obtained on all the 20 lecturers from 300 students. The results are provided in Table 1.

Table 1

#### Dependent samples t-test on lecturers' commitment to teaching

Period	N	Mean	SD	df	t	p-value
Pre-observation	300	1.85	0.358	299	-2.47	0.014
Post-observation	300	1.87	0.337			

The dependent samples t-test for equality of means showed a statistically significant result,  $t(300) = -2.47$ ,  $p < 0.05$ . The result implied that there was a change in the commitment to

teaching. The post-observation mean ( $M = 1.87$ ,  $SD = 0.337$ ) was greater than the pre-observation mean ( $M = 1.85$ ,  $SD = 0.358$ ). Teachers became a little more regular and punctual in class. Though the result is statistically significant, it must be realized that the mean change of 0.02 units, shows just a slight increase. This result is not surprising since commitment to teaching takes a longer time to stabilize and this intervention was for only a three-month period.

2. What is the effect of peer observation on a lecturer's general style of teaching?

Lecturer's general style of teaching was assessed by 16 items on the questionnaire. The style of teaching involves adequate preparation, questioning ability, pacing of teaching, methods of teaching, stimulating student interest, individual attention, and time management. Information

was obtained on all the 20 lecturers from 294 students. The results are provided in Table 2.

Table 2

**Dependent samples t-test on lecturers' general style of teaching**

Period	N	M	SD	df	t	p-value
Pre-observation	294	1.57	0.499	293	-1.582	0.115
Post-observation	294	1.58	0.473			

The dependent samples t-test for equality of means did not show a statistically significant result,  $t(293) = -1.582, p > 0.05$ . Lecturers used the lecture method of teaching mostly during the pre-observation stage. However, after the observation, they continued to use the lecture method because class sizes were still large and the infrastructure and equipment required to use methods that are different from the lecture method were not put in place during the period of the study.

**3. What is the effect of peer observation on a lecturer's assessment of student progress?**

Lecturer's assessment of student progress was assessed by two items on the questionnaire. The items involve giving enough and relevant assignment to reinforce learning and grading and providing frequent and timely feedback to students. Information was obtained on all the 20 lecturers from 297 students. The results are provided in Table 3.

Table 3

**Dependent samples t-test on lecturers' assessment of student progress**

Period	N	M	SD	df	t	p-value
Pre-observation	297	1.26	0.580	296	-7.70	0.000
Post-observation	297	1.42	0.490			

The dependent samples t-test for equality of means showed a statistically significant result,  $t(296) = -7.70$ ,  $p < 0.05$ . The result implied that there was a change in the lecturers' assessment of student progress. The post-observation mean ( $M = 1.42$ ,  $SD = 0.490$ ) was greater than the pre-observation mean ( $M = 1.26$ ,  $SD = 0.580$ ). Formative assessment takes place in the Polytechnic as 40% of the final grade in each course comes from continuous assessment scores during the semester. Though class sizes were still large and workload per lecturer was still high, the lecturers improved upon their assessment of student progress. The increase of 0.162 unit over the pre-observation mean is of real practical significance.

### 3. What is the effect of peer observation on lecturer-student relationship?

Lecturer's relationship with students was assessed by three items on the questionnaire. This was obtained through lecturer's making themselves accessible to students, their preparedness to work with students outside class hours and showing genuine interest in students learning and having good rapport with them. Information was obtained on all the 20 lecturers from 297 students. The results are provided in Table 4.

Table 4

**Dependent samples t-test on lecturer-student relationships**

Period	N	M	SD	df	t	p-value
Pre-observation	297	1.40	0.610	296	-7.91	0.000
Post-observation	297	1.57	0.552			

The dependent samples t-test for equality of means showed a statistically significant result,  $t(296) = -7.91$ ,  $p < 0.05$ . The result implied that there was a change in the lecturer-student relationships. The post-observation mean ( $M = 1.57$ ,  $SD = 0.552$ ) was greater than the pre-observation mean ( $M = 1.40$ ,  $SD = 0.610$ ). This implies that lecturer's became more actively involved with the students after the intervention. The 0.165 unit increase over the pre-observation mean is of real practical significance.

4. What is the opinion of lecturers on the introduction of peer observation of teaching?

From the professional dialogue session, the concept of peer observation and review of teaching (PORT) was highly appreciated by the lecturers who took part in it. The lecturers were happy about the opportunity to discuss the findings together. Most (80%) of the lecturers expressed their willingness to partake in regular PORT exercises. The majority (90%) of the lecturers saw the observation exercise as challenging since it involves being observed by one's own peers who know much about the techniques of teaching and the subject matter.

Lecturers liked the post observation interviews, especially when the feedback from the responses to the questionnaires was communicated to them. Sixty percent of the lecturers expressed surprise about some of the revelations made since their attitude and aims of doing certain things they did were at variance with the interpretations given to them by the students. These lecturers were happy that it would serve as a means of getting to

know themselves even better. Most (85%) of the lecturers were unaware of the impact their attitudes had on students. The findings underscore the importance and the need for self-awareness in teaching and interactions with colleagues and students.

### **Discussion**

This study has a number of limitations. In the first place, it was conducted in one institution with a limited number of lecturers (i.e. 20 in all). Secondly, only one co-author did the observation of the peers. Thirdly, there were only two observations of each lecturer. Fourthly, items assessing commitment to teaching and student progress were very few in number.

In spite of the limitations of the study, the results have shown that peer observation of teaching has a great potential in improving the performance of lecturers as well as the quality of teaching and learning in general in higher educational institutions in Ghana.

In a number of tertiary institutions, student appraisal of teaching effectiveness is often used to judge the effectiveness of lecturers. However, this approach of using student appraisal has a number of problems. Students who find lecturers to be very strict and maintain discipline in their classes are graded down by the students. Lecturers who receive a poor grading from a particular class sometimes change their attitude from friendliness to antagonism, and makes scathing comments like, "You students think I do not know how to teach". Other lecturers who receive poor reports have revenge on their minds. Secondly, lecturers who are very generous with grades are often given extremely favourable remarks by the students irrespective of their approach to teaching. Students' appraisal of teaching effectiveness should therefore not be the sole judge of a lecturer's effectiveness in teaching. Peer observation reports can be combined with the student reports to produce more information on lecturers' effectiveness.

Peer observation and review of teaching is both developmental and remedial. Lecturers are able to know their areas of weakness in teaching through the professional dialogue and together both the appraised and the appraiser (peers in action) work out ways to improve upon the quality of teaching. It is not only the appraised that gain knowledge from the professional dialogue, but the appraisers also learn from the process. They

are exposed to a variety of teaching issues and techniques as well as a wealth of knowledge that would have an impact on their own teaching.

The study has shown that a number of lecturers were not aware of the impact and interpretations that were associated with their actions and attitudes. Staff appraisal, through the peer observation of teaching, enables the individual lecturer to become aware of the impact his/her teaching has on learners and assists him/her in modifying his/her teaching techniques when found necessary.

A major finding of practical significance was the improvement in the lecturers' assessment of student progress. Assessment of student progress plays important roles in higher education. Assessments enable students to acquire certificates and degrees that are needed for employment in the world of work. Students primarily gain admission to institutions of higher learning to acquire skills that will make them marketable in the world of work. The acquisitions of skills are testified by the certificates and degrees awarded them. The award of the certificates, diplomas and degrees are based on the scores that are obtained through the assessments of their work. It is therefore important that care is taken in providing the grades, marks or scores on which the decision to award the certificates, diplomas and degrees are based.

Assessment also enables lecturers to determine the progress made by each individual student in learning. The feedback or knowledge of results that lecturers provide helps students to identify their own strengths and weaknesses. It helps the lecturers also to discover the learning difficulties of the students and thus provide remedial action. It is therefore important that assessment results are reliable and valid. This helps in making wise and informed decisions on the students.

The interventions in the study also led to improved lecturer-student interactions. Lecturer-student relationships are important in promoting teaching and learning. A good relationship creates a congenial environment where students can relax and concentrate on their academic studies. Rogers (1981) believed that positive human relationships enable people to grow and therefore instruction should be based on concepts of human relations. The lecturer's role is that of a facilitator who has a personal relationship with students and who guides their growth and development. When the right atmosphere is created in the lecture room, student progress becomes rapid.



The process of peer observation of teaching should first involve a meeting between the observed and the observer. During this interview, the purpose of the observation and the observation guide would be discussed. Both should agree in advance about the focus of the observation. The observation should be open. There should be no hidden or restricted statements or issues. After the observation, feedback should be provided in the form of a professional dialogue. The discussion should begin with the areas of strength before engaging in a discussion of areas that require improvement. Finally, the observed should reflect on the feedback and issues discussed during the dialogue to crystallize the gains from the observation.

To determine who should do the observation, it is important to consider the purpose of the review. For peer observation and review of teaching to improve the quality of teaching and learning in higher institutions, the lecturer being reviewed should play a role in selecting or providing the names of reviewers. This aspect is important because the observed lecturer will be more receptive to constructive criticism from a colleague that is trusted. Departments may develop guidelines on the choice of reviewers. Where possible, the lecturers can change the appraisers from time to time. Each institution should develop a lecturer observation guide which each lecturer would use for the observation. After each observation, the appraiser and the appraised should hold a professional dialogue after analyzing the results of the guide together.

It must be noted however that peer observation of teaching has a number of weaknesses. In the first place, data is often biased due to previous data, personal relationships and peer pressure. Secondly, peer relationships may suffer. There may be loss of respect. Thirdly, there is possible bias due to an observer's preference for own methods of teaching and learning. Fourthly, there is the fear of being exposed as an incompetent or lazy lecturer. These weaknesses can be overcome mainly through training, as well as free and frank discussions on the importance of the PORT.

It must also be noted that PORT can be time-consuming and demands additional time from the observer. The observer has to use his/her own private time for the observation since institutions may not include that in the official minimum number of periods each lecturer is expected to lecture for a week. Diplomatic and personal skills of the observer would

come into play. An untrained observer may reinforce bad practice, resulting in misgivings about the program. Lecturers' may also make unusual efforts at teaching but this may be to the advantage of the teaching-learning process.

When used effectively, PORT (a) makes the private act of teaching a public collaborative process, (b) creates a new environment for evaluating teaching and learning, (c) provides multiple data sources for evaluation of teaching and learning, (d) provides a more complete and more accurate assessment of the teaching and learning enterprise (e) encourages a dialogue about teaching and (f) has multiple beneficiaries (D'Andrea, 2002). In addition, PORT promotes self-assessment, provides new ideas and skills on teaching and learning, stimulates discussions among colleagues about teaching and learning, and results in improvements in teaching and learning.

### **Conclusions and Recommendations**

Results from the study have shown that the peer observation and review of teaching could bring about an increase in the quality of teaching and learning in higher educational institutions. Tertiary institutional heads would stand to gain if this process is introduced in their various institutions.

The gains from the practice of peer observation and review of teaching would however be dependent upon the use of the following recommendations. It is recommended that the code of confidentiality should be observed in the process. Peers who identify weaknesses in the performance of their colleagues must be circumspect in how they use the information. They must help the colleague in overcoming them in a healthy and supportive atmosphere. Information obtained should be used exponentially to strengthen the flaws and weaknesses detected on the appraised.

It is also recommended that a peer observation of teaching policy be made as a guideline for the exercise and should be a component of continuous improvement in teaching and learning. The policy should address the following questions.

1. What are the institutional goals and purposes for the observation and review?
2. What should be observed and how frequent?

3. Who should do the observation and review?
4. How should the observation and review be conducted?
5. What instrument should be developed and used?
6. How would the observation and review results be used?
7. What issues and problems are likely to arise?

Finally, on the basis of the limitations and weaknesses in the present study, it is recommended that further research on this topic **should** increase the number of lecturers to be observed as well as the number of peer observers. In addition, there should be more than two observations of each lecturer. Further, the number of items assessing commitment to teaching and student progress should be increased.

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## **Teacher-Utilization in Teacher Training Colleges in the Volta Region of Ghana**

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### **Abstract**

The study investigated teacher-utilization in teacher training colleges in the Volta Region of Ghana. Two hundred and four respondents completed the questionnaire and the interview guide on the mode of teacher utilization.

It was found that the teaching load of majority of teachers in teacher training colleges in the Volta Region was below the minimum norm of 16.7 hours per week set by Ghana Education Service. Also, all the teachers spent more time on their teaching-related activities. Again, it was found that teachers with administrative responsibilities and those without administrative responsibilities differed in their rates of utilization though not significantly. However, considering teaching-related activities, majority of the teachers worked for more than the maximum of 40 hours per week.

It is recommended that the present minimum load of 16.7 hours per teacher per week be reviewed because estimates given by respondents for teaching-related activities ranged between 45-90 hours per week.

### **Introduction**

The history of the development of education in Ghana from pre-independence to post-independence period is full of recommendations by various committees set up to review the existing education system and draw guidelines on improving education by way of formulating educational policies. Various governments have had educational review Committees that have proposed reforms of the education system with the Kwapong Education Review Committee of 1967 and the Dzobo Education Committee of 1972 being prominent ones (Ministry of Education, 1974). The Kwapong Committee recommended, among others, that all first degree graduates of the University of Ghana and the University of Science and Technology (now Kwarne Nkrumah University of Science and Technology) should not be selected for further studies in medicine or other essential services of technical nature but should do two years teaching as a form of

national service. The committee insisted that graduates of the University College of Cape Coast (now University of Cape Coast) should spend five years in teaching before being permitted to take up other appointments. The Dzobo Committee (MOE, 1974) recommended, among others, that from the 1972/73 academic year, all primary one to three classes should be staffed with trained and certificated teachers. Again the committee suggested that by 1975, all primary schools in Ghana should be staffed with trained teachers. There was, thus, the need for a viable teacher education programme that would feed the education system with qualified trained teachers who would lay a solid foundation, especially at the primary school level, on which further education would be built.

Generally, targets that are set by educational reforms would not be achieved without the availability and efficient use of teachers. Ginzberg and Smith (1967) have pointed out that the common error in both developed and developing countries is to focus exclusively on manpower supply while giving brief consideration to manpower utilization. Ginzberg and Smith (1967) emphasized that in manpower analysis, attention must be paid to utilization. They have argued that improvement on utilization of manpower offers one of the best prospects of securing a better balance between a limited supply and an unfulfilled demand for skill. Ginzberg and Smith (1967) accused developed and developing countries for their failure to match manpower supply with utilization and suggested that for prospective supply to meet demand, there must be considerable measure of how the effectiveness of people with varying skills are utilized. In a joint module prepared by the Ministry of Education and Culture, Ghana and the International Institute for Educational Planning in 1988, cited by Atta Boison (1992), teachers could be utilized in terms of the students in their class and the number of lessons they teach. According to this module, therefore, pupil-teacher ratios and teaching load could be used as indicators of teacher utilization.

Harbison (1973) expressed the opinion that under utilization of human resources has been the most serious problem facing less developed countries. He emphasized that though the concepts of employment and unemployment in developing countries have partly been different from those applicable to the advanced countries, it is clear that manpower in developing countries has been grossly under utilized. To him, the strategy of human resource development is concerned with the two-fold objective of

building skills and providing productive employment for unutilized or under utilized manpower.

Harris and Liba cited by Atta-Boison (1992) have contended that one important means of measuring the level of teaching staff utilization in schools is through teaching load. The teaching load in his view should generally be understood to include all the time and energy a teacher will expend in fulfilling duties and responsibilities relating directly or indirectly to the task of teaching.

The Organization for Economic Co-operation and Development [OECD] (1971) has stated that it is not enough to provide the school system with a reserve of qualified staff. A more rational development of teaching staff is essential. The OECD noted that the legal number of teaching hours required meant little. The teacher's other duties should be taken into consideration. These other duties include lesson preparation and marking of students' assignments, exercises and projects. It was revealed by OECD that in England and Wales, there are no fixed number of working hours for a full-time teacher. The teacher was engaged to carry out all activities that take place at school.

Edem (1987) argued that a teacher's morale is likely to be affected by the teaching load. The teacher will be demoralized if he/she finds a class too large or had too many lessons to teach daily, which require a great deal of preparation. Edem noted that if a teacher's responsibilities are of intolerable complexity and magnitude so that the teaching load exceeds the average of 25 to 30 periods a week, his/her morale is likely to be affected. The teaching load is partly determined by the staff establishment.

In general, staff establishments are determined according to the size of the service or establishment concerned and the work expected to be done. This applies to workers such as teachers, doctors, extension workers and others in related services. In the educational sector, teacher-pupil ratio, the minimum number of periods of lessons a teacher should teach in a week and the maximum number of students a class can hold are used to determine staff establishment.

One of the early proponents of effective utilization of human resources as cited by Arrigazzi, and de Simone (1972) was Taylor. Taylor, according to Arrigazzi and de Simon, argued in his scientific management theory that each employee of an organization should have a clearly defined

daily task. This task, according to Taylor, should require a full day's effort to complete.

In Ghana, there have been established norms that guide teacher-utilisation. According to the Ghana Education Service (GES, 1997), the student teacher- ratio in a teacher training college should be 15:1, and the maximum class size was put at 40 students. The minimum teaching load of 25 periods per week with each period lasting 40 minutes were also established. This, however, did not take account of the teacher's non-teaching load which comprises other teaching-related duties such as lesson preparation, marking of tests, projects and long essays, as well as supervision of students' teaching practice.

Teachers in the training colleges, therefore, complained about their workload because of the combination of both curricula and co-curricula activities. Officials of the Ministry of Education and the GES, however, argued that most teachers in the teacher training colleges were not effectively utilized and that their teaching load, most often fell below the norm of 16.9 hours a week, derived from the 25 periods to be done by each teacher per week. The question then is: To what extent does staff establishment set by the GES reflect teacher-utilisation in the teacher training colleges?

The purpose of the study was to investigate teacher-utilization in the seven public teacher training colleges in the Volta Region of Ghana. The study was conducted to determine the amount of time teachers spent on teaching, lesson preparation, setting and marking of assignments. It was also to find out how much time was spent on co-curricular activities such as supervision and administration in order to make informed judgement about teacher utilization in the teacher training colleges.

**The following research questions guided the study:**

- (1) To what extent does teachers' teaching load in the teacher training colleges meet the norm set by the Ghana Education Service for effective teacher utilization?



- (2) Do teachers with administrative responsibilities and those without administrative responsibilities differ with regard to their total work load?
- (3). Which of the following factors: teaching load, teaching-related duties, administrative duties, most affect teacher utilization in teacher training colleges in terms of the number of working hours?
- (4) In what way does staff establishment affect teacher utilization in the teacher training colleges?

## **Method**

### **Participants**

The population for the study was made up of all the 245 principals and teachers in the seven public teacher training colleges in the 2000/2001 academic year in the Volta Region of Ghana. However, at the end of the data collection exercise, 204 respondents comprising 197 teachers and 7 principals constituted the final sample.

### **Research Design**

The study was a cross-sectional survey to investigate teacher utilization in teacher training colleges in the Volta Region of Ghana. According to Kerlinger (1986, P. 377), surveys enable an examination of "large and small populations (or universe) by selecting and studying samples chosen from the populations to discover the relative incidence, distribution and interrelations of sociological and psychological variables"

### **Instrument**

A questionnaire was the main data-gathering instrument used. The questionnaire had sixteen items mainly the checklist type and open-ended questions. The first part of the questionnaire elicited demographic information on the respondents per college including their highest academic qualification and professional qualification. The second part had items pertaining to respondent's workload. The teachers were asked to estimate the amount of time used in performing duties such as lesson preparation, marking long essays, setting test items, conducting and marking assignments among others, as well as all the activities that each of them

performed in the questionnaire. The questionnaire was developed and pre-tested in three teacher training colleges in the Central Region of Ghana.

An interview guide was also used to obtain information from the principals of the colleges about teacher-utilization in their colleges. Examples of items in the interview guide included the following: Do you have the full compliment of teaching staff requested for each of the subject/courses offered in the college? Does the Ghana Education Service allow for extra teaching staff considering the teacher-student ratio establishment set by the Ghana Education Service have on teacher recruitment for your college?

### **Procedure**

To ensure effective collection of the needed data, personal visits were made to the training colleges to discuss the questionnaire with the vice-principals who served as research assistants for the study. The questionnaires were numbered before they were given to each of the 245 teachers in order to facilitate easy follow-up, collation and analysis of the data. The data collection process began on 4<sup>th</sup> June 2000 and ended on the 26<sup>th</sup> of the same month. The questionnaires were personally delivered to the vice-principals who in turn administered them to the teachers and have the completed questionnaires collected.

Computation of respondents' total load was based on the number of periods of teaching plus the estimated hours spent on co-curricula and administrative activities. In the teacher training colleges in Ghana, each teaching period is forty (40) minutes. Thus, the number of teaching periods of respondents were converted into hours. For example, a teacher teaching for 12 periods, a week's total number of hours for teaching is 8 hours (i.e.,  $[40 \times 12]/60$ ). In this study the total load of a teacher was considered to be teaching and teaching-related activities. The data gathered for the study were scored and analysed statistically to determine frequencies and percentages to show the distribution of teaching load in the colleges. The mean hours of teaching per week for teachers in the colleges for those with administrative and non-administrative responsibilities were calculated. Table 1 shows the number of hours of teaching by the respondents. The independent t-test was used to determine whether there was a statistical difference between the mean hours of total load per week of teachers with

administrative responsibilities and those without administrative responsibilities. This is shown in table 2.

### Results

The result of the study showed that 118 (57.8%) of the teachers had teaching load that was below the norm of 16.7 hours per week set by the GES, while 12 (5.9%) teachers had teaching load above the norm. Seventy-four of the teachers (36.3%) had teaching load around the norm.

Table 1

*No Hours of Teaching done by the Teacher Respondents*

Teaching Hours	Frequency	Percent
Below 16.7	118	57.8
16.7-17.0	74	36.3
Above 17.0	12	5.9
Total	204	100

The data in Table 1 show that majority of teachers in the colleges had teaching load that was lower than the stipulated 16.7 hours of teaching per week approved by the GES. Based on the available data, the answer to research question one is that, to a large extent, most teachers do meet the norm set by the Ghana Education Service for effective teacher utilization.

To determine whether there was a significant statistical difference in hours of utilization between the teachers in the colleges who held administrative positions (such as vice-principals, housemasters, housemistresses, senior housemasters or senior housemistresses) and their colleagues who had no officially assigned administrative duties the t-test of independence was employed. That was to establish whether there was any difference in their total work load due to the additional administrative and other responsibilities. Table 2 presents the results of the analysis of teachers with administrative responsibilities and teachers without administrative responsibilities.

**Table 2**

*Descriptive statistics and results of the t-test analysis for administrators and non-administrators in terms of hours of teaching.*

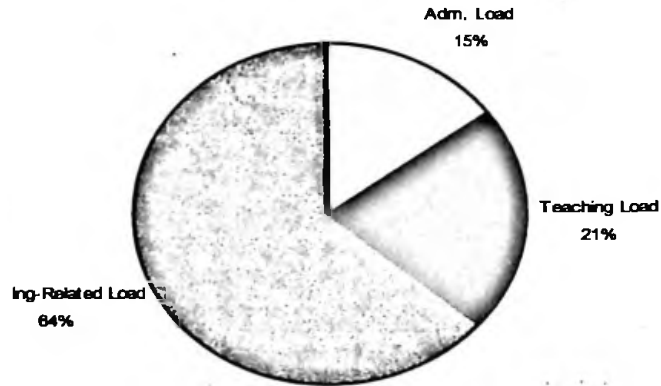
Category of teacher	N	X	SD	t	p
Administrators	146	3.2740	1.06687		
				-861	.390
Non-Administrators	56	3.3793	.64421		

$P > 0.05$

With hours as the unit of measurement, Table 2 shows that the mean workload of teachers with administrative duties and teachers without administrative duties are almost the same ( $3.27 \approx 3.38$ ). Administrators' data show ( $M=3.27; SD=1.07$ ) while the non-administrators data are ( $M=3.38; SD=.64$ ). The t-test result is  $t(203) = -861, p = .390$  (two tailed). This shows that there is no statistically significant difference between the administrators and non administrators in terms of their teaching and teaching-related activities.

To determine which of the factors: teaching, teaching-related and administrative responsibility that most influenced teacher utilization in the colleges, data from the estimates of time allotted to the activities were considered as 100% and distributed among the three factors (i.e Teaching load, Administrative load and Teaching-related load) being considered. The analysis took the form of calculating the total load in percentages for all the teachers for each of the factors being considered.

Figure 1 shows the contribution of each of the factors to the total utilization of the teachers in the colleges.



**Fig. I:** Distribution of time in percentages among the factors.

It is observed that administrative responsibilities (load) accounted for 15%, while teaching load accounted for 21%. The teaching-related load accounted for 64%. It could, therefore, be said that the factor that most influenced teacher utilization in the colleges was teaching-related load which include lesson preparation, test item writing, and marking of assignments, among others.

From the interview with the principals of the colleges it became clear that the student-teacher ratio of 15:1 as established by the GES was not favourable to the teachers because they did more work considering the teaching and teaching-related duties that they performed. It came to light from the interviews that, in almost all the colleges, there were teachers who taught more than one subject because though the colleges had the full compliment of the teaching staff, the number of periods called for additional teachers. For example, in almost all the colleges, agricultural science teachers had the additional responsibility of teaching lessons in biology. Some Ghanaian language teachers also taught lessons in religious and moral education while some education studies teachers particularly those who did methodology in

mathematics as part of their diploma or degree programmes taught lessons in mathematics methodology.

It was found out that the teachers in the colleges were not happy with their workload as indicated in Table 3.

Table 3

*Teachers' satisfaction with workload*

Satisfaction	Frequency	Percent
Yes	23	11.3
No	181	88.7
Total	204	100

The data in Table 3, show that only 23 (11.3%) teachers said they were satisfied with their total workload while 181(88.7%) teachers expressed their dissatisfaction with their total workload. Data from the estimates for individual teachers' teaching-related duties ranged between 45-90 hours per week, and this supports the views of the principals of the colleges concerning the recruitment and utilization of teachers in the colleges.

### Discussion

The result of the study shows that on the average, the teaching load of teachers was lower than the minimum number of hours expected by the Ghana Education Service. The data on individual teachers' load ranged from 10.7-17.7 hours with the mean for the colleges being 14.3 hours per week. The result supports findings of Atta-Boison (1992) and Harbison (1973) who concluded in their studies that the teaching load of teachers is lower than the norm, but compensated for by the load in terms of teaching-related duties such as lesson preparation and marking of assignments. The result also supports findings by Caron cited by Herzberg (1989) that teachers' workload does not always correspond to official norm.

According to the Ghana Labour Redeployment Programme (1990), the labour laws of Ghana require a worker to work for 40 hours a week, with an average of 8 hours a day. Since the GES norm demands that teachers in colleges teach 16.7 hours a week, it is assumed that teaching-related duties will be completed by teachers in 23.3 hours a week which is the difference between the norm of 16.7 hours and 40 hours stipulated by the labour laws of the country. Due to unavailability of a time table indicating definite periods for the performance of teaching-related duties, teachers were asked to estimate the time used in performing duties such as lesson preparation.

marking of tests, assignments, supervision of teaching practice by students and long essays written by students. The results presented indicate that teachers in the colleges spent 64% of the total working hours (Fig.1) meant for teaching, administrative duties and teaching-related activities on only teaching-related duties, and this makes it the factor that most influenced teacher-utilisation. This confirms a survey by the Chilean Technical Secretariat for Technical Education cited by Arrigazi and de Simone (1972) that about 13.7% of the total teaching hours was, in fact, devoted to tasks other than teaching such as setting test items, marking long essays, and supervising students on practice teaching. The study also supports the assertion by the organization for Economic Co-operation and Development (OECD) (1971) that the legal number of teaching hours required meant little because the teacher's other duties should be taken into consideration.

On teachers satisfaction with their workload, as many as 181 (88.7%) teachers indicated that they were not satisfied with their workload, with 23 (11.3%) teachers indicating their satisfaction. The result confirms findings by Edem (1987) who argued that a teacher's morale was likely to be affected by his or her teaching load. Such a teacher would be demoralized if he or she found the class too large or had too many lessons to teach daily, which required a great deal of preparation. According to Edem (1987), if a teacher's responsibilities comprising teaching and teaching-related activities exceeded the average of 25 to 30 periods a week, his or her morale was likely to be affected.

### **Conclusion**

The study established that the teaching load of the majority of the teachers studied was below the minimum norm of 16.7 hours per week. The picture that emerged from this finding is that the teaching load of the majority of the teachers in the teacher training colleges in the Volta Region is less than 16.7 hours a week. However, many of the teachers, according to them, spent more than 40 hours per week on teaching-related and administrative duties than was expected by the labour laws of Ghana.

### **Implications of the study for education**

From the findings of the study it has been observed that whereas the teacher-student ratio of 15:1 may be appropriate, the actual workload of the teacher is far more than envisaged. Again the norm of 16.7 hours per week

per teacher set by the Ghana Education Service is not realistic since teachers' actual workload is not on only teaching. The Ghana Education Service should therefore compute the number of hours actually spent on all that teachers do as part of their load at the teacher training colleges.

There is the need for the Ghana Education Service to study closely what actually goes into the teacher's workload to enable the relevant authorities see the current appropriateness or otherwise of the student-teacher ratio of 15:1.

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## **Voices of Inspiration: Hope for Graduate Teacher Retention in Basic Schools**

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### **Abstract**

The paper investigated the motivation of teachers to continue teaching at the basic school level. Utilising a mixed-methods approach, basic school teachers' motivation to continue teaching at that level after obtaining degree certificate, was analysed. The study found that contrary to the findings of previous studies that teaching in basic schools is not the preference of teachers with degree certificates, many graduate teachers intend to stay in basic school teaching. However, this intention is influenced, mainly, by altruistic and intrinsic motives rather than extrinsic considerations. The desire to contribute to the development of children and society; helping to lay a solid foundation for education in Ghana; and engaging in programmes pursued at university, were stated as strong motivating factors. Implications are drawn and recommendations for attracting and retaining graduate teachers at the basic school level are made.

In many countries, the public image of teaching is that it is a low status profession. Treiman conducted a comprehensive comparative study on 26 occupations in 53 developed and developing countries in terms of the prestige accorded those occupations by the public (Fwu & Wang, 2002). In that study, secondary and primary school teaching placed 15<sup>th</sup> and 17<sup>th</sup> respectively. In Taiwan where teachers enjoy a relatively higher occupational prestige than their international counterparts, studies conducted in various parts of the country over three decades consistently placed secondary and primary school teaching only six steps higher than their international ranking in comparison with other occupations (Fwu & Wang, 2002). Thus, teaching in general and primary school teaching in particular is not the occupational preference of high calibre candidates. Unsurprisingly, Lockheed and Verspoor (1991) argue that people often become teachers for reasons of personal advancement rather than a commitment to the public good, and that "teaching in primary schools neither attracts nor retains the best-qualified and most-motivated individuals" (p. 92).

This appears to be the case in Ghana in that most people use teaching as a stepping stone to other occupations, and graduate teachers in particular do not want to teach in basic schools (Akyeampong, 2001). Recent research findings indicate that a significant proportion of basic school teachers who obtained degree qualifications either moved up to secondary teaching or left teaching for other occupations in the public and private sectors (Akyeampong & Lewin, 2002; Hedges, 2002). For example, between 1997 and 2001, about 70% of teachers who went on study leave to upgrade their qualifications from certificate to degree level did not return to their posts after completing their programmes (Akyeampong, 2002). It is not only basic school teachers who obtain degree qualifications who leave that level; graduate entrants to teaching normally prefer to be in secondary schools, teacher training colleges or work in the district and regional education offices. This lack of enthusiasm for basic school teaching as a long term career has resulted in shortage of teachers at that level (Lewin, 2002; Quansah, 2003).

The shortage of teachers in basic schools has become acute at a critical time in the country's educational development. By a constitutional mandate, the Government of Ghana is required to provide free compulsory universal basic education for all school-age children (Government of Ghana, 1992). The pursuance of this national goal ties in with the objectives of Education for All and the Millennium Development Goals to which Ghana is committed. Unfortunately, the teachers who would serve as the catalysts of educational reform do not stay at the basic level for long. In the light of this attrition, educationists and the general public wonder if there is any hope for basic education in Ghana.

The purpose of the study was to find out the factors which cause the few teachers who continue to teach in basic schools even after acquiring higher qualification, to stay.

## **Method**

### **Participants**

The participants were 145 non-graduate professional teachers who were pursuing various education programmes (e.g. psychology, social studies, arts and primary education) at University of Cape Coast (UCC) to upgrade their teaching qualifications to degree level. Collectively, they had taught in all the 10 regions of Ghana. Each had at least three years teaching experience.

### **Instruments**

Two instruments were used for the study. The first was a questionnaire which attempted to gauge participants' intentions to continue or leave basic school teaching after their studies, and the reasons thereof. The second was focus group interviews to explore in greater detail the reasons given by participants who indicated, in their questionnaire responses, intention to leave basic school teaching.

### **Procedure**

The questionnaire was distributed to 400 participants, and 365 completed and returned it. Out of this number, 145 (39.7%), comprising 69 males and 76 females, indicated intention to continue basic school teaching after completing their degree programmes; 56 intended to move to secondary teaching; and the remaining 164 planned to leave the teaching field.

Since the study focus was on respondents who intended to continue teaching in basic schools, 40 of the 145 who had indicated this intention (split equally between male and female) were invited to participate in focus group interviews. The respondents were invited to participate in the focus group interview because of the clarity of their responses to the questionnaire; they had also volunteered to participate. Care was taken to ensure that they fairly represented, in terms of their ages, gender, years of teaching experience, the programmes they were pursuing, regions in the country where they had taught, and their year of study (first-fourth year), the original 145 who indicated intention to continue basic school teaching. That was done through maximum variation purposive sampling (Patton, 2002). Five sessions of focus groups were held, each comprising four male and four female participants and lasting between 60 and 90 minutes. The interview questions sought to gain more insights into the questionnaire responses, that is, the respondents' reasons for choosing to stay in basic school teaching after their degree programmes. For example, how did the nature of the programmes they were pursuing influence their decision to remain in basic schools? All the interviews were audio-taped, with participants' consent, and transcribed for analysis. Through a process of constant comparison (Glaser & Strauss, 1967), a set of recurring themes representing the participants' reasons for continuing basic school teaching were identified.

The questionnaire and focus group interviews produced a substantial amount of data which provided rich understanding of the reasons for the teachers' decisions to continue teaching in basic school. These are presented in the section that follows.

### **Results**

The focus of the study was on teachers who intended to continue basic school teaching. They were between the ages of 21 and 55 with over 80% under 41 years. Their teaching experience ranged from one to thirty-five years; about 96% had taught for 1-20 years. With the exception of three, all the teachers were of the rank of Senior Superintendent or below. Some of the reasons given by the teachers pertained to staying in the teaching profession in general while others related to continuing basic school teaching in particular.

#### **Reasons for Staying in Teaching**

As a group, the teachers stated five categories of reasons for intending to remain in the teaching profession in general. The categories and illustrative statements from the questionnaire responses and focus groups are presented in Table 1.

**Table 1: Why Teachers Decided to Remain in Teaching**

<i>Influential Factor</i>	<i>Illustrative Statements</i>
Intrinsic interest in teaching as a profession	I have the love and desire for teaching. I love the [teaching] profession.
Contributing to educational advancement and national development	I want to be part of educational development in Ghana I want to help build the nation Ghana.
Stemming out graduate teacher attrition	To encourage other colleague teachers to remain in the profession. To serve as a role model for other teachers to emulate.
Utilising already-gained experience	After teaching for 8 years I have gained much experience in teaching and therefore would want to continue.

I have gained more experience [7 years] for the job.

Compatibility of professional and personal needs.

I will get time for my own family after closing.

The teacher has enough time for other activities.

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Respondents seemed resolute in their choice of teaching as a career. They saw this profession as a tool for social advancement, and as a place where one can easily make use of and build on prior expertise. For them, teaching also provides opportunities for contributing one's quota to the solution of educational problems such as the shortage of qualified teachers, without sacrificing time for attending to important personal needs. Thus, the social and the personal needs are held in a dynamic equilibrium.

For three of the respondents, fulfilling their contractual obligation under the study leave policy was an influential factor in their decision to stay in teaching. One questionnaire response indicating this reason was "I am on study leave with pay". However, further expatiation on these reasons during focus group showed that they did not see the requirements of the policy as forcing them into an occupation they did not like. Rather, they saw themselves already rendering a service to their people and their country; they also saw the sponsorship they had enjoyed as a sacrifice by other people. Consequently, for them, the very fact that they were pursuing education programmes, and the sponsorship offered by GES provided an opportunity to continue that service and reciprocate the investment made in their university education. "I am here to pursue a programme in Education and my people, that is, the GES, are sponsoring my university education. That gives me the chance to go back to do my service as I have been doing", one explained. "And also as a Ghanaian, the national cake is being used to cater for my education at the moment; so if I don't go back to serve the people, it would not be patriotic on my part just to leave the service", another echoed.

### **Reasons for Staying in Basic School**

Respondents were determined not just to continue their professional practice as teachers but more so at the basic school level. They stated different reasons for preferring basic school to secondary teaching. Table 2 presents the various themes in their explanations, the number of times these were mentioned in the questionnaire responses, and examples of the specific statements (more detailed explanations from the focus group interviews are presented in the text). Some factors were mentioned only a few times in the questionnaire responses. However, the warmth, enthusiasm and persuasiveness with which the teachers explained them during the focus group interviews, indicate how important a factor such as the teachers' obligation under the study leave contract, was in their decisions. Themes which were stated 40 or more times in the questionnaire (28% or more in Table 2) are elaborated below; themes least mentioned in the questionnaire yet discussed passionately in the focus group interviews are summarized.

#### **A Passion for Working with Children**

As Table 2 shows, a significant proportion of the reasons given for wanting to continue basic school teaching can be characterised as altruistic. The most prominent reason under this category is a passion for working with children and contributing to their advancement (37.2%). This desire appears to have developed from and/or been reinforced by the teachers' previous experience with children:

I have always been encouraged, and like to teach in a primary school or at the basic education level because I enjoy teaching the children....And from the experience that I had when I taught for three years in a primary school, I think if I am able to pursue a degree programme at university here and go back to them I will be able to impart some of the knowledge that I have acquired here to the children.

**Table 2: Why Teachers Decided to Continue Basic School Teaching (N=145)**

Reason	f	%
<i>A passion for working with children</i> Because I love children. I want to impart some knowledge to children at this level.	54	37.2
<i>Laying a strong foundation for education</i> I want to help build a solid foundation in terms of learning in Ghana. To lay a very strong foundation for learners upon which they can build at the senior secondary level.	53	36.6
<i>Engaging in programme pursued</i> My area of study is related to that level. Because the programme trains teachers purposely for the basic level.	41	28.3
<i>Easy to handle children</i> Children at the basic level are easy to teach. The basic school children can be corrected easily.	14	9.6
<i>Challenging negative perceptions</i> To set an example that graduates can teach at the basic school level. To correct the erroneous idea that teachers with no certificate, or less qualified teachers teach in basic schools.	8	5.5
<i>Utilising and building on existing experience</i> I have gained more experience in teaching in basic school. I have taught in the basic school for long.	6	4.1



<i>Desire to pursue further study/research in basic education</i>	5	3.4
To pursue my master's programme in Basic Education in Ghana.		
To research in basic school level teaching.		
<i>Solving problem of teacher shortage</i>	5	3.4
The basic school lacks more professionals to teach.		
Being in basic school will offer me the opportunity to help solve the problem of teacher shortage.		
<i>Less workload</i>	5	3.4
The workload is easier, especially with the writing of lesson notes.		
The workload is not so tedious and time-consuming.		
<i>Same salary and professional development opportunities</i>	4	2.8
Salaries are based on ranks and not level of teaching.		
Teachers can upgrade their qualifications when teaching at this level.		
<i>Fulfilling study leave obligations</i>	3	2.1
I am on study leave with pay.		
To justify the huge expenses made on me by Government in training.		
<i>More challenging work</i>	2	1.4
Teaching at the basic level brings the best in you as a teacher since you have to use many methods for deeper understanding.		
The basic schools make the teacher very experienced.		

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### **Laying a Strong Foundation for School Reform**

Reforming the school system by helping to build a strong foundation at the basic level also emerged as another altruistic theme. As many as 53 (36.6%) teachers stated this in their responses to the questionnaire. One respondent saw a firm basic education as the panacea to the problems at the subsequent levels: "I believe one thing, that if the foundation is good, when you build upon it, it is easier. So if we are able to get the graduate teachers [to lay] the solid foundation at the basic level, a lot of problems at the JSS and SSS will all be solved". This concern derived from respondents' reflection on their own experience in the primary school, either as students or teachers. Respondents thought as students they "suffered a lot" in the hands of non-professional teachers who only followed a transmission model of pedagogy, leading to students passively receiving knowledge with very little understanding. Recalling his own experience in primary school, one respondent argued that the presence of untrained teachers at the basic school level deprives children of quality teaching and learning, and the nation of the good foundation needed at that level:

I realised that from primary 1 to primary 4 none of the teachers who took us was a professional; so some of us suffered a lot. So, you see, the teaching skills were not there... They were teaching rote learning. They were not using materials because they even did not know how to use the materials... When you are building [a house] and the foundation is not strong, I think whatever you do at the top, the building is still weak and it will collapse one day... So I find it wise to go back and then help my people, especially in the villages.

In retrospect, respondents realised that their own teaching as non-graduate professional teachers at the basic level had some shortfalls, especially in the assessment of student learning. This realisation was obviously as a result of the new knowledge and skills they had acquired in the university. It engendered in them a resolve to go back and help build and reshape the system through their individual contributions as well as collaborative efforts.

### **Engaging in Programme Pursued**

All the respondents were pursuing Bachelor of Education programmes, two of which – B.Ed (Basic Education) and B.Ed (Primary Education) - were specifically targeted at basic school teaching. Respondents who were enrolled in these programmes stated the nature and focus of their

programmes of study as a reason for wanting to continue teaching at that level (28.3%). According to the respondents, each of the two programmes equips them with the knowledge, teaching skills, methods and techniques to enable them teach confidently at the basic school level, and they were eager to put their new expertise into practice. Typical responses include: "The programme provides the skills for teaching and the teacher can confidently teach"; "Having obtained the necessary techniques of teaching at the basic level, I would put them into practice".

### **A Role Model to Rural Children**

A related altruistic theme that came up in the interviews is the wish to be an exemplar to children in the rural communities, where there may be few educated persons. There was a sense that some respondents had assumed this role in the past, had found it helpful and therefore wanted to continue. The desire to be a guide to children in the rural communities was particularly strong in respondents who experienced rural life during their initial years of teaching and found it beneficial: "Moreso we've been posted to the village where some of us who had not experienced village life before were able to get a chance to experience a lot of things. So I find it is worth it to go back when I finish my degree programme".

### **Challenging Negative Perceptions**

Eight respondents (5.5%) decided to continue basic school teaching in order to challenge negative perceptions some graduates and the Ghanaian public have about a career in teaching, especially, at the basic school level. The perceptions could be summarised as: "Teaching is a financially unrewarding and socially inferior occupation. One cannot make it in life being a teacher. Basic school teaching is for unqualified or less qualified teachers". Some respondents viewed this as an objectionable notion which must be rectified. They also wanted to prove to graduate teachers who look for lucrative jobs elsewhere that "no matter where you are, if you put much effort into whatever you are doing, you can make it". Ultimately, the teachers hoped to set personal examples of graduate teachers teaching in basic schools for their colleagues to follow, reverse the trend of graduate teacher attrition at that level, and solve the problem of teacher shortage. Their resolve was strengthened by the fact teaching at the basic level would cause them nothing because they "will all be receiving the same salary, the same promotion, [and] start from the same rank".

## **Discussion**

The study demonstrates that all does not seem doom and gloom for basic school teaching in Ghana, for almost 40% (N=365) of respondents (a group identified as attrition-prone) planned to stay in basic schools. They were motivated, primarily, by reasons particular to teaching, namely, the education of young children, to improve their life chances; a sense of providing service to society; and application of their degree subject.

On the one hand, this is not surprising because working with children and nurturing their learning is what teachers are trained to do (Cockburn, 2000). Research on teacher motivation, commitment and job satisfaction in Sub-Saharan African and Organisation for Economic Cooperation and Development (OECD) countries has consistently found that 'working with children' is a key source of teacher job satisfaction and retention (Bennel, 2004; General Teaching Council, 2003; OECD, 2005). It is the rewarding nature of the job rather than pecuniary gain that is the prime motivation for becoming and remaining a teacher. Some studies report that such intrinsic factors are dominant at the early stage of the teaching career, but become less important in the later years. Once on the job, personal circumstances such as compatibility with private life, flexible schedule, recognition, and career opportunities are found to be more important to teachers (OECD, 2005). In contrast, after several years of teaching, the teachers in the current study were still motivated by intrinsic factors.

On the other hand, the teachers' decision astonishes the Ghanaian educationist and researcher. The educational workforce in Ghana and in the world generally, is a hierarchical bureaucracy whose structure encourages and rewards role and occupational migration away from children and teaching. Besides, the general perceptions about teaching and basic school teachers promote migration from teaching to other jobs and from basic to secondary school teaching. For teachers who were on the threshold of getting a degree qualification, which facilitates this migration, to deny themselves of an opportunity desired by many remains inexplicable beyond the altruistic factors identified in this study.

The findings of the study confirm but, in some respects, also challenge the notion of graduate teachers' lack of enthusiasm for basic school teaching identified in previous research (e.g. Akyeampong & Lewin, 2002; Hedges, 2002). On the issue of 60% (N=365) of the total sample who completed the questionnaire intending to leave basic school teaching, the study confirmed previous findings. On the question of 40% of the teachers in this study being

enthusiastic to continue teaching at the basic school level, the findings seem to contest prior evidence. Of course, more qualitative data on the personal and professional identities of these teachers would have lent more leverage to this assertion. Nevertheless, the teachers' altruistic and intrinsic motivations for intending to continue basic school teaching, revealed in the focus groups, provide reasonably qualitative data that support the quantitative evidence of the teachers' enthusiasm.

The 'hopeful voice' of the teachers in this study who planned to stay in basic school teaching because of its intrinsic satisfiers is very strong. This should be a source of encouragement to policy makers, educationists and other stakeholders who might have felt despondent about the future of basic schools in Ghana. Taking the respondents at their word, it points to a bright future for basic school teaching and signals the advent of a light in the tunnel towards 'graduatisation' of the teaching force at that level. An all-graduate teaching staff in basic schools would eliminate the perceived acrimony between non-graduate and graduate teachers in schools, and raise the standard of teaching and learning.

### **Implications for Retention Policy and Research**

The study involved basic school teachers who were upgrading their teaching qualifications to degree level in one of Ghana's two teacher education universities. Their 'voices' may not, therefore, echo the motivations of all basic school teachers. Collectively, however, the teachers had taught in all the 10 regions of the country and had considerable experience in basic school teaching; their views may therefore provide useful pointers to teacher retention policy and research. A few suggestions are made below in this regard.

Firstly, teacher education policy would benefit, in terms of retaining teachers, from recruiting candidates who are motivated by altruistic factors into teacher training, and from integrating these factors into the training programmes. In particular, the desire to work with children and contribute to their advancement; to render service to people; and to share knowledge and ideas with people should be identified in prospective teachers through well-designed and conducted interviews, and avenues for their development provided in the pre-service training programmes offered in the teacher education institutions. Practising teachers who demonstrate continuous and effective engagement with their altruistic interests should be recognised and rewarded. For example, demonstrated teaching that caters for the

educational needs of socio-economically disadvantaged children; or proven interest in, and action to promote, issues of social justice and equity could be made essential criteria for selecting best teachers who are recognised during the annual Best Teachers Award ceremony.

Secondly, the decision by the Ghana Education Service (GES) to reduce the number of teachers who are awarded study leave with pay for further studies, and rather encourage them to upgrade their qualifications through distance education appears a cost-effective retention measure. However, to achieve the objective of gradually building up a body of graduate teachers at the basic school level, teachers who enrol in programmes with direct focus on basic education should be supported financially. Such teachers are more likely to want to teach at that level with their degree qualifications than those whose degree programmes are not similarly focused. The former group of teachers tend to see a direct relationship between the new knowledge and skills they acquire and their classroom practice. They are, therefore, more eager to put the new ideas to test.

Thirdly, the teachers' intention to continue basic school teaching prompts a review of aspects of current teacher deployment policy. According to GES conditions of service, graduate teachers start on the rank of Principal Superintendent and are, by virtue of their status and by policy, required to work in secondary schools, teacher training colleges and district offices in various teaching and administrative capacities (GESC/GNAT, 2000; GES, 2003). This practice not only deprives basic schools of the knowledge, skills and experience of graduate teachers, but also implies that basic school teaching is for non-graduates, a perception held by a section of the Ghanaian public and some teachers (Cobbold, 2007). This policy needs to be revised. The review should first re-examine the duties of a Principal Superintendent as specified in the conditions of service to enable graduate teachers trained for basic school teaching to operate at that level. As a complementary measure, there should be intensive public education to change the Ghanaian society's perception of basic school teachers, and teaching at that level made more lucrative through provision of attractive incentives.

Finally, further research replicating this study could widen the sample to include teachers upgrading their teaching qualifications to degree level in University of Education, Winneba (UEW) as well as degree holders who are already teaching at the basic level.

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## **Relationship between Attitude of Teachers to Mathematics and Teaching of Mathematics in Cape Coast Municipality**

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### **Abstract**

This study explored primary and junior secondary school (basic school) teachers' attitude toward mathematics, the teaching of mathematics and the relationship between the two. A survey of attitude of 190 basic schoolteachers from 22 basic schools in the Cape Coast municipality of Ghana was carried out using questionnaires. Data collected were analyzed using means and standard deviations. Pearson's correlation was used to investigate the relationship between teachers' attitude toward mathematics and the teaching of mathematics. The results from the study revealed among others that teachers had positive attitude towards mathematics ( $M = 39$  out of 50,  $sd = 8.0$ ) and the teaching of mathematics ( $M = 71.7$  out of 90,  $sd = 9.9$ ). The study also revealed a moderate correlation between teachers' attitude toward mathematics and the teaching of mathematics.

Students' performance in mathematics in Ghana in recent times has not been the best (MOESS, July 2007; Annamuah-Mensah and Mereku, 2005). Statistics show that on the average, 36% of candidates who sat for Basic Education Certificate Examination (BECE) from 2002-2004 in mathematics either obtained a very weak pass or failed (MOESS, July 2007).

Attitude of teachers towards mathematics and its teaching are believed to play a vital role in the teaching and learning of mathematics as well as students achievement in mathematics (Bobis & Cusworth, 1994; Kulm cited in Ernest 1988; Bishop & Nickson 1983; Thompson 1992). Literature shows that teachers have the potential to influence the attitude and the self-concept of young children (Sullivan, cited in Bobis and Cusworth, 1994). The literature suggests that there is a significant correlation between students' attitude and achievement in mathematics (Kulm, cited in Bobis & Cusworth, 1994).

Literature shows that all is not well with the teaching and learning of mathematics at the basic school level in Ghana (Davis, 2004; STM 2001 Ghanaian Group, 2001). Davis (2004) for instance found in his study in the Central Region of Ghana that the teaching of mathematics at the basic

school level was mainly textbook directed, with teachers making very little use of teaching learning materials in their lessons.

A growing body of research have demonstrated that teacher's own perception of self as a teacher in a particular discipline area together with his/her beliefs and attitude about that subject affects the framework in which learning experiences are selected and presented (Clark & Perterson, 1986; Nias, 1989; Smith cited in Bobis & Cusworth, 1994). Some researchers have reported some degree of agreement between teachers' attitude towards mathematics teaching and their instructional practices (Bobis & Cusworth, 1994; Lacefield, 1996). Bobis and Cusworth (1994) asserted that teachers' attitude towards the teaching of mathematics and science is closely related to students' achievement in these subjects. Bishop and Nickson (1983) asserted that there is an important relationship between the attitude of teachers, especially their attitude to mathematics and the effectiveness or the quality of their teaching in mathematics. Lacefield (1996) argued that teachers' attitude towards mathematics instruction are prone to reveal their views of students' mathematical knowledge, how they learn mathematics, and the general functions and missions of schools. He asserted further that regardless of the grade level taught, if any teacher's beliefs concerning mathematics instruction are not positive, students' opportunities for learning mathematics may be stifled.

Fennema and Franke (1992), and Thompson (1992), asserted that the translation of teachers' mathematical knowledge into viable teaching strategies is mediated by the way that knowledge is held. That is to say that one's philosophy of mathematics and of the teaching of mathematics influences how one's knowledge of mathematics per se gets translated into classroom activities. White, Way and Perry (2006) investigated the attitude of pre-service teachers towards the teaching of mathematics and their attitude to mathematics in Australia and found an overall trend towards positive attitude to mathematics and the teaching of mathematics. However, White, Way and Perry (2006) did not report of the relationship between their subjects' attitude towards mathematics and their attitude to the teaching of mathematics although some researchers have called for the need for studies to investigate the relationship between the two (see Ernest, 1988).

There seems to be paucity of studies on attitude of male and female teachers towards mathematics and the teaching of mathematics. However, some studies have shown significant gender differences in interest to

mathematics between male and female students (Kaiser-Messmer, 1993; Eshun, 2000).

Despite the fact that the study reviewed above have found relationship between teachers' attitude towards mathematics and students' achievement on one hand (Kulm cited in Ernest, 1988) and others have found relationship between teachers attitude towards the teaching of mathematics and students' achievement on the other hand (Karp, 1991; Bobis and Cusworth, 1994), not many studies have been done in Ghana to ascertain the attitude of teachers towards mathematics and the teaching of mathematics. The present study was therefore designed to investigate the attitude of teachers towards mathematics, the attitude towards the teaching of mathematics and the relationship between teachers' attitude to mathematics and the teaching of mathematics. It also investigated attitude of male and female teachers towards mathematics and the teaching of mathematics.

### **Purpose of Study**

The purpose of the study was to investigate basic school teachers' attitude towards mathematics, the teaching of mathematics and the relationship between the two in the Cape Coast Municipality of Ghana. The following research question and hypotheses were used to guide the study:

1. What are the attitude of basic school teachers toward mathematics?
2. What are the attitude of basic school teachers towards the teaching of mathematics?
3. What is the relationship, if any, between the attitude of teachers towards mathematics and the teaching of mathematics
4. There is no significant difference between male and female teachers' attitude towards mathematics.
5. There is no significant difference between male and female teachers' attitude towards the teaching of mathematics.

## **Methodology**

### **Sample**

The study used the survey method to explore teachers' attitude to mathematics and the teaching of mathematics. The purposive sampling technique was used to select 22 out of 74 public basic schools from all the six circuits in Cape Coast Municipality. The selection of schools was based on the number of schools in each of the circuits and type of school (rural/urban, single sex/ co-education, performing/non performing schools). The simple random sampling technique was then used to select one hundred and ninety (190) basic schoolteachers from the 22 selected public basic schools. In order to ensure fair representation of the basic schoolteachers, the proportion of primary and junior secondary school teachers were taken into consideration before the selection of teachers in each of the schools. Out of the hundred and ninety basic school teachers who took part in the study 102 (53.7%) were primary school teachers and the remaining 88 (46.3%) were junior secondary school teachers of which 110 (constituting 57.9%) of them were females and the remaining 80 (42.1%) were males.

### **Instrument**

Two sets of questionnaires were developed and used in the data collection. One set elicited information about the attitude of basic schoolteachers towards the teaching of mathematics while the other set elicited information about the attitude of basic schoolteachers towards mathematics. The questionnaire that was used to collect information about teachers' attitude towards the teaching of mathematics was made up of 18 attitudinal items while the one that was used in collecting information about teachers' attitude towards mathematics was made up of ten attitudinal items. The items were the closed-ended 5-point Likert-scale type and respondents had to choose from Strongly Agree, Agree, Undecided, Disagree, Strongly Disagree. The researcher developed the items and validated the instruments among basic schoolteachers in a pilot district. The reliability test for the questionnaires that were used to collect information on teachers' attitude towards the teaching of mathematics gave a Cronbach alpha value of 0.87 whereas the one that was used to collect information on their attitude towards mathematics gave a Cronbach alpha value of 0.92.

### **Research Procedure**

The data collection was done by the researcher and two research assistants in the Cape Coast Municipality at the beginning of the second term of the academic year 2006/2007 (January 2007). The questionnaire administration was done during the first week of school reopening. The schools were visited to administer the questionnaire. In each of the schools, the purpose of the study was explained to the headteacher and teachers before the administration of the questionnaires. The questionnaire on teachers' attitude towards the teaching of mathematics was administered and collected after which the questionnaires on teachers' attitude towards mathematics was also administered. Some of the questionnaires were completed in the presence of the researcher and other assistants while the others were collected later by the research assistants. The return rate of the questionnaires was hundred percent.

### **Data Analysis**

The data collected were analyzed using the Statistical Package for Social Sciences (SPSS) software. Means and standard deviations were computed and used to present and discuss trends in respondents' attitude. In order to ascertain whether there was any significant difference in attitude of male and female teachers towards mathematics and the teaching of mathematics, the two-tailed t-test at .05 level of significance was used. Pearson's correlation coefficient was used to determine whether there was any correlation between teachers' attitude towards mathematics and teaching of mathematics. The scatter plot was used to pictorially present the relationship between teachers' attitude to mathematics and the teaching of mathematics.

For the purpose of analysis the positive attitudinal items were rated as follows; 5-strongly agree, 4 - agree, 3 - undecided, 2 - disagree and 1 - strongly disagree whereas the negative attitudinal items were rated as follows; 5 - strongly disagree, 4 - disagree, 3 - undecided, 2 - agree and 1-strongly agree. For each of the individual items a mean score of more than three indicates a positive attitude, a score of three indicates neither positive nor unfavorable attitude and a score of less than three indicates unfavorable attitude. The overall mean scores were also used to discuss the overall attitude of the teachers. For the overall mean scores, the most positive attitude will have an overall mean score which is equals to the number of items times five, the most unfavorable attitude will have an overall mean

score which is equal to the number of items times one and neither positive nor unfavorable attitude is expected to have an overall mean score which is equal to the number of items times three. Thus for their attitude towards mathematics an overall mean score of more than 30 (3 times 10 items) indicates a positive attitude towards mathematics while an overall mean score of more than 54 (3 times 18) indicates a positive attitude towards the teaching of mathematics.

### **Results**

The results of the study have been presented in three sections namely teachers' attitude towards mathematics, teachers' attitude towards the teaching of mathematics and the relationship between attitude towards mathematics and the attitude towards the teaching of mathematics.

#### **Teachers' Attitude towards mathematics**

Results of teachers' attitude towards mathematics are presented in Table 1. The results show that generally teachers seem to have quite positive attitude towards mathematics. This is reflected in their overall mean score of 39.0 out of 50 (i.e. average 3.9 out of 5) with standard deviation of 8.0. A look at the means of each of the individual items shows that their mean score was more than 3.0 in each of the cases (an indication of positive attitude to mathematics). Teachers disagreed that they hate mathematics (mean of 4.4). They also disagreed that they wish they did not come into contact with mathematics (mean of 4.3). A look at the means of some of the items such as "mathematics is easy for me (3.5)", "working mathematics exercises is fun for me (3.7)" and "mathematics is a difficult subject (3.7)" however, seems to indicate that all is not well with the attitude of some these teachers.

Table 1: Teachers' attitude towards mathematics

Items	M	sd
mathematics is easy for me	3.5	1.1
I like mathematics	4.0	1.0
I like studying mathematics	3.9	0.9
mathematics is interesting for me	4.0	0.9
Working mathematics exercises is fun for me	3.7	1.1
I hate mathematics	4.4	0.8
I do not like studying mathematics.	4.1	1.0
mathematics is boring to me	4.1	1.0
mathematics is a difficult subject.	3.7	1.2
I wish I do not come into contact with mathematics	4.3	1.0
Overall mean score (out of 50)	39.0	8.0

Table 2 shows the results of the attitude of teachers towards mathematics by gender. The results show that the overall mean attitude score towards mathematics for the male teachers was significantly higher ( $M = 41.0$  out of 50 [average of 4.1 out of 5],  $sd = 6.7$ ) than that of the female teachers ( $M = 37.0$  out of 50 [average of 3.7 out of 5],  $sd = 8.5$ ),  $t(190) = 2.917$ ,  $p = 0.004$ . This implies that male teachers had a more positive attitude towards mathematics than female teachers.

Table 2: Teachers overall mean attitude towards mathematics by gender

Category of Attitude	Sex	Mean (out of 50)	sd
Attitude towards mathematics	Male (N=80)	41	6.7
	Female (N=110)	37	8.5

### Teachers' Attitude towards the teaching of Mathematics

Results of teachers' attitude towards the teaching of mathematics are presented in Table 3. Like their attitude towards mathematics, the results in Table 3 show that generally teachers seem to have positive attitude towards the teaching of mathematics. This is reflected in their overall mean score of 70.7 out of 90 (average of 3.9 out of 5) with standard deviation of 9.9. A look at the mean scores of each of the individual items shows that with the exception of one item "I like answering all students' questions in mathematics class (2.5)" the means for each of the individual items was more than three (an indication of positive attitude towards the teaching of mathematics). However, a look at the means of some of the items such as "I find mathematics easy to teach (3.7)" seems to suggest that some teachers need to be encouraged to develop a more positive attitude towards the teaching of mathematics.

Table 3: Teachers' attitude towards the teaching of mathematics

Items	M	sd
I enjoy teaching mathematics.	4.2	0.8
I find mathematics easy to teach	3.7	1.0
Teaching mathematics is interesting to me	4.1	0.9
I like using several approaches in solving questions when I am teaching mathematics	4.0	0.9
I like marking class exercises in mathematics	4.1	0.9



I like preparing lesson notes for mathematics lessons	4.2	0.9
I like involving students in my mathematics lessons	4.0	0.7
I like solving practical mathematics questions with students' in class	4.2	0.8
I like giving homework in mathematics	4.1	0.8
Teaching mathematics is a bother to me	3.9	1.1
Teaching mathematics is boring for me.	4.0	0.9
I do not like attending in-service training in mathematics	4.1	1.0
I wish I would not have to teach mathematics everyday	3.7	1.2
I do not like preparing mathematics-teaching aids	4.0	1.1
I enjoy using the lecture method in teaching mathematics	4.0	1.1
I like answering all students' questions in mathematics class	2.5	1.2
I do not like using teaching aids when teaching mathematics	3.9	1.1
I do not like marking mathematics homework	4.0	0.8
<b>(Overall mean score (out of 90))</b>	<b>71.7</b>	<b>9.9</b>

Table 4 shows the results of the attitude of teachers towards the teaching of mathematics by gender in the Cape Coast municipality. The results show that the overall mean scores of male teachers' attitude towards the teaching of mathematics is not significantly different ( $M = 71.1$  out of 90 [average of 4.0 out of 5],  $sd = 10.5$ ) from that of the female teachers ( $M = 70.5$  out of 90 [average of 3.9 out of 5],  $sd = 11.4$ ),  $t(190) = 0.379$ ,  $p = 0.704$ . This implies that the two groups of teachers had similar attitude towards the teaching of mathematics. However the high standard deviations

associated with the means for each of the groups suggests a wide variation in attitude of teachers towards the teaching of mathematics among male and female teachers.

Table 4: Mean Attitudinal Score of the teaching of mathematics by gender of teachers

Category of Attitude	Sex	N	Mean (out of 90)	sd
Attitude towards mathematics	Male	80	71.1	10.5
	Female	110	70.5	11.4

#### **Relationship between Attitude to Mathematics and Attitude towards the Teaching of Mathematics**

Figure 1 shows the scatter plots of the relationship between the attitude of teachers to mathematics and the teaching of mathematics. The results from the scatter plot show that the points cluster around the line of best fit. This is an indication that there is a linear relationship between attitude of teachers towards mathematics and the teaching of mathematics. Pearson's correlation coefficient was 0.64. This result shows that there is a moderate correlation between teachers' attitude towards mathematics and the teaching of mathematics. The two variables however share only 41% of the variance in common. This means that 59% of the variance found between the two variables (attitude towards the teaching of mathematics and attitude towards mathematics) remains unexplained.

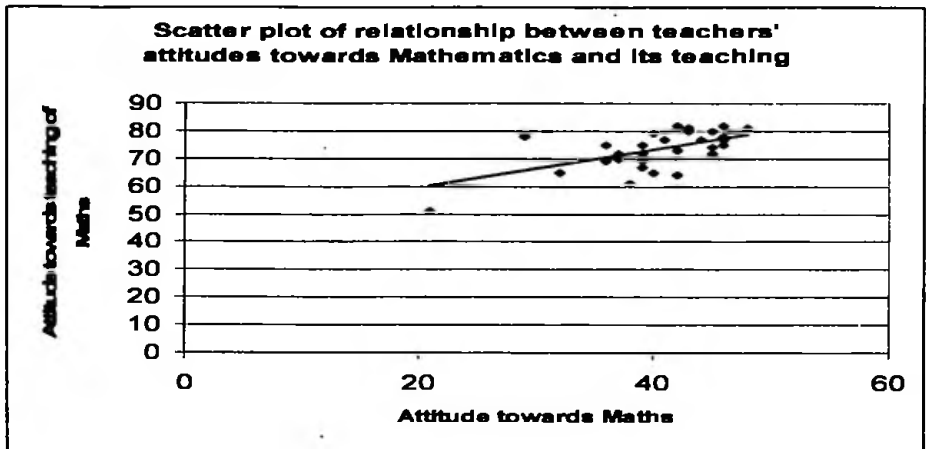


Figure 1: Scatter plot of the relationship between attitude to mathematics and its teaching

### Discussion of Results

Teachers' overall mean score of 39.0 out of 50 (i.e., average 3.9 out of 5) with standard deviation of 8.0 on their attitude towards mathematics and their overall mean score of 70.7 out of 90 (average of 3.9 out of 5) with standard deviation of 9.9 on their attitude towards the teaching of mathematics indicate that the basic school teachers in the study had quite positive attitude towards mathematics and the teaching of mathematics, as the mean scores were more than 3 out of 5 (neutral) in each of the cases. This is an indication that teachers generally agreed with the positive attitudinal items and disagreed with the negative attitudinal items. This finding is similar to those of Southwell, White, Way and Perry (2006) who also found an overall trend towards positive attitude to mathematics and the teaching of mathematics in their studies with pre-service teachers in Australia.

A look at the attitude by gender shows that male teachers attitude towards mathematics was significantly more positive (mean attitude of 41 out of 50, [average of 4.1 out of 5]) as compared to the female teachers (37 out of 50 [average of 3.7 out of 5]). Unlike their attitude towards mathematics, there was no significant difference in mean attitude of male and female teachers towards the teaching of mathematics (mean of 71.1 out of 90 [average of 4.0 out of 5] and 70.5 out of 90 [average of 3.9 out of 5])

for male and female teachers respectively). This is an indication that they had similar attitude towards the teaching of mathematics. This shows that even though male teachers seemed to have a more positive attitude to mathematics compared to female teachers, their attitude towards the teaching of mathematics was very similar to that of the female teachers. This shows that female teachers' positive attitude towards the teaching of mathematics could be accounted for by other factors. Finding on teachers' attitude towards mathematics seems to confirm that of Kaiser-Messmer (1993) who also found a significant gender difference in interest in mathematics between boys and girls.

A look at the relationship between teachers' attitude to mathematics and the teaching of mathematics revealed a moderate correlation between the two. However, the high level of the unexplained variance (59%) seems to suggest that teachers' attitude toward mathematics alone does not determine their attitude towards the teaching of mathematics.

### **Conclusion**

Generally basic school teachers in the Cape Coast Municipality of Ghana had positive attitude toward mathematics and the teaching of mathematics. This implies that teachers have the attitude it takes to promote effective mathematics teaching and learning in basic schools. In-service training providers should therefore use the positive attitude of teachers towards mathematics and the teaching of mathematics as an indication that they can be supported to teach mathematics effectively. Attitude toward the teaching of mathematics are only partially explained by attitude toward mathematics. Hence there is the need for further investigation into the other factors that account for teachers' positive attitude towards the teaching of mathematics.

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