

Effects of Perceived Science Teachers' Classroom Behaviours on the Academic Performance of Senior High Schools Science Students

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Abstract:- The study sought to assess the effects of perceived science teachers' classroom behaviour characteristics on the academic performance of science students in Ghanaian senior high schools (SHS). A descriptive survey was the design used for the study. Seventy-two (72) third year elective science students (made up of 37 boys and 35 girls) drawn from six (6) SHS in the Central and Ashanti Regions of Ghana were used for the study. A purposive sampling procedure was used to select the sample size. Questionnaire and interview were the 2 instruments used for the study. Data from the questionnaires were analyzed quantitatively using descriptive statistics whereas data from the interview guide were analysed qualitatively. It was revealed that almost all the students (71; 98.6%) agreed that science teachers did not offer words of encouragement to them during lessons. Also, most students (67; 93.1%) agreed that most science teachers were quick tempered and they changed their mood very quickly. Also, majority of science students' perceived that most SHS science teachers were unfriendly; impatient; unloving; gender bias and also had teacher's pets in class. It was observed that science teachers' inappropriate classroom behaviours had negative impact on students' academic performance. It was revealed that young science teachers exhibited inappropriate behaviours; with young female science teachers exhibited the most inappropriate behaviours. It was recommended that science teachers should put up good and appropriate behaviours so as to help improve students' performance and attitudes towards science.

Keywords:- Perceived, performance, behaviour.

I. INTRODUCTION

According to Bergqvist (2012), the importance of science and technology in the present society is increasing, and science education is a growing domain that gains international concern and becomes an important education for modern citizenship. In support of the importance of science education to the country, in a speech to members of the National Academy of Sciences in 2009, President Obama addressed the need to improve science education in the United States and the rest of the globe.

In Ghana, the poor performance among SHS science students in the Senior Secondary School Certificate Examination (SSSCE) and West African Senior School Certificate Examinations (WASSCE) has been a source of

worry to many parents and other stakeholders in science education over the years. Maduabum (1995) attested to this fact by stated that students' performance in the WASSCE is very low and poor in science, producing the poorest annually since 1960. This poor performance of students in science has been attributed to several factors by many researchers.

Studies by (Dhindsa, 2002; Dhindsa & Treagust, 2009) attributed students' poor performance in science to students' perceptions of science as being difficult; students' experiencing difficulty in learning the subject; inadequate background content knowledge for learning advanced content; and ability to apply their knowledge to real world problems. Other authors (Coll & Treagust 2002; Boujaoude & Barakat, 2000) have also attributed the poor performance to that the large amount of content taught in a grade level; content abstractness and the traditional teaching style with emphasis on rote learning.

However, studies by (Koul & Fisher, 2004; Tuncel, 2009; Ajaja & Eravwoke, 2013) have incriminated science teacher's classroom behaviours as a paramount factor that has contributed to poor academic performance among students in sciences. According to (Madike, 2015; Goodman, 2016), science teacher behaviours have both direct and indirect influence on students' learning outcomes.

On their part, Ajaja and Eravwoke (2013) pointed out that the inappropriate behaviours exhibited by science teachers are known to influence their quality of instruction which directly affect their students' learning and their performance in schools.

Sahin and Sari (2010) indicated that most students take the teacher as a role model if he/she exhibits good behaviour characteristics in the classroom; and that they tend to learn or copy behaviours put up by the science teachers in the classroom. Their study revealed that most science students learn these behaviours through their persistent teacher-student interactions in the science classroom. The study urged science teacher to carry and exhibit very good and appropriate behaviours in his/her classroom so as to influence his/her students' learning.

According to Anane and Anyanful (2016) behaviour is a description of observable outcome of the teacher and it may be positive or negative. The study further indicated that behaviour is an action, which is different at different time and can be good (appropriate/effective) or bad (inappropriate

/ineffective). The study concluded that science teacher's good classroom behaviours can lead to high students' achievement whereas bad behaviours could lead to poor performance in science.

A good science teacher always exhibits good behaviour characteristics such as being committed to his/her work, able to accept the feelings of students; attempts to find solutions for the reported problems by the students; and has close, friendly and effective relationship with students (Tuncel, 2009; Konti, 2011). Koul and Fisher (2004) posited that a teacher's behaviour, when interacting with students, can have a lasting impact either positive or negative on students' learning and performance.

The influence of science teacher's classroom behaviours on students' performance during science lessons cannot be disputed. When teachers teach, they exhibit some behaviour characteristics which have the tendency to influence students' performance and their attitudes towards learning.

Since science teacher's classroom behaviours can influence science students' performance in school science; it imperative to assess behaviours exhibited by teachers in science classroom and its effects on students' performance in science. It against this background, that this study was undertaken to assess the effects of perceived science teachers' classroom behaviour characteristics on the academic performance of science students in Ghanaian SHS.

A. Statement of the Problem

A classroom science teacher plays very crucial role in the teaching and learning of science to students at all levels of education. They are seen as agents of social change, facilitators of desirable learning, counsellors to the learners, consultants and resource persons in the teaching and learning process. Apart from these crucial roles, the modern day science teacher really needs to be competent not only in his/her area of the subject matter but also need to exhibits a high degree of good behaviour characteristics in the teaching and learning situation.

Studies by (Borich, 2004; Tuncel, 2009; Konti, 2011) posited that a science teacher needs to be a communicator, a disciplinarian, a conveyor of information, an assessor, a classroom manager, a counsellor, a decision-maker, a role model, and a surrogate parent.

According to (Anane & Anyanful, 2016), the behaviour characteristics of a teacher fall within hidden curriculum concept which is not taught to students but they unconsciously learn them. Thus, students may learn teacher's classroom behaviours unconsciously or consciously.

Studies by (Koul & Fisher, 2004; Anane & Anyanful, 2016; Konti, 2011) pointed out that an issue facing education is the variety of behaviour characteristics exhibited by science teachers during lesson delivery; and these behaviours could influence students' performance either positive or negative.

Since the teacher's classroom behaviour characteristics could impact either negative or positive on students' academic

performance; it is therefore necessary to assess the effects of perceived science teachers' classroom behaviours on the academic performance of science students in Ghanaian SHS.

It is in the light of this, that this study was conducted to assess the effects of perceived science teachers' classroom behaviours on the academic performance of Ghanaian SHS science students.

B. Purpose of the Study

This study sought to assess the effects of perceived science teachers' classroom behaviours on the academic performance of science students in Ghanaian SHS. Specifically, the study intends to find out:

- Behaviour characteristics perceived to be exhibited by SHS science teachers in classrooms.
- Science students' perceptions of their science teachers' behaviours in science classroom.
- Effects of perceived science teacher's behaviours on the academic performance of students?

C. Research Questions

The following three (3) research questions guided this research study:

- What behaviour characteristics are perceived to be exhibited by science teachers in science classrooms?
- What are the science students' perceptions of science teachers' behaviours in science class?.
- How does the perceived science teacher's behaviours affects the academic performance of the students in the science classroom?

II. REVIEW OF RELATED LITERATURE

The review of related literature that supports the study was done under:- behaviour characteristics exhibited by teacher; students' perceptions of teachers' behaviour; and effects of teacher's behaviour on students' academic performance.

A. Behaviours Exhibited by Science Teacher

Several studies (Borich, 2004; Ajaja & Eravwoke, 2013; Goodman, 2016) have shown that science teachers exhibit several behaviour characteristics that have the tendency to influence the teaching and learning process either positive or negative.

Studies by (Kumaravadivelu, 1992; Borich, 2004) indicated that appropriate behaviour characteristics exhibited by science teachers include being purposeful, knowledgeable, task-oriented, relaxed, enthusiastic, credibility, warmth, supportive and have a sense of order and good humour.

Borich (2004) pointed out that a teacher who gives class work; announces tests in advance; enthusiastic about the subject being taught and shows it by facial expression, voice inflection, gesture and general movement is more likely to hold the attention of students than one who does not exhibit these behaviours. Goodman (2016) stated that, most effective teachers with good behaviours help their students to learn best,

were happy, had a passion for teaching, understood their content and always had a smile on their face.

In a similar study, Konti (2011) posited that good and friendly teachers are the teachers, who are able to transfer their feelings to students, attempts to find solutions for the reported problems by the students and prepares an atmosphere for students to express their thoughts and feelings freely.

Sezgen (1988) revealed that ineffective teachers are irrelevant; do not motivate and usually stand away from the students. These teachers avoid being friendly with their students and that they only believe that they do their mission by teaching.

Researchers (Evertson, 1995; Goodman, 2016) indicated that students' learning is increased, when science teacher increases students' learning time; move around the classroom to monitor students seatwork; make abundant use of activities that are at or slightly above students' current level of understanding and avoid timing error by stopping misbehaviour promptly.

B. Students' Perceptions of Teachers' Behaviour

Allport (1966) defined perception as the way individuals' judge or evaluate others with whom they are familiar in everyday life. Perception is important because it influences the information that enters working memory (Adediwura & Tayo, 2007). Madike (2015) opined that student perceptions are thoughts, beliefs and feelings about persons, situations and events.

On their parts, Ajaja and Eravwoke (2013) opined that effective science teachers who have an impact on students' lives are those who have a genuine interest in students, know their subject matter and possess detailed information about the way students learn and develop.

In a study, Konti (2011) pointed out that a science teacher should carry sample characteristics for their students; should have close, friendly and effective relationship with students. The study further revealed that a friendly science teacher should be willing enough to answer students' questions; and he/she should not be gender bias.

In another study, Tuncel (2009) posited that effective teacher is expected to be patient, committed to students' welfare; and firm but not strict. Goodman (2016) stated that most effective teachers who help students learn best, loving, respectful, honest and kind with positive attitudes.

C. Effects of Teachers' Behaviours on Students' Academic Performance

Research studies (Koul & Fisher, 2004; Tuncel, 2009; Ajaja & Eravwoke, 2013) have indicated positive correlation between science teacher's behaviours and the students' learning and performance.

Madike (2015) revealed that science teacher behaviours have both direct and indirect influence on students' learning outcomes. Koul and Fisher (2004) pointed out that students

with effective science teachers' behaviours have reported more positive academic performance, attitudes and satisfaction in schools. Tuncel (2009) pointed out that when a teacher gets closer to students; maintain students' discipline in class; and exhibits greater evidence of enthusiasm, then his/her students are more likely to be interested, excited about learning and perform better.

Studies by (Harding, 1996; Ajaja & Eravwoke, 2013) posited that science is dehumanized and it is masculine in nature; and student achievement is positively related to teacher characteristics of masculinity. This means that which tends to suggest that the exhibition of the effective classroom behaviours to bring about effective learning by students may to some extent be hinged on the ability of the science teachers to exhibit masculine characteristics.

Ajaja and Eravwoke (2013) pointed out that there is a significant difference in classroom behaviours of science teachers between males and females; with males demonstrating higher good and appropriate classroom behaviour characteristics scores than the female science teachers.

III. METHODOLOGY

A. Research Design

The descriptive survey was the design used for the study. This design was used because it allows the use of multiple data collection tools in seeking to address the research questions in an in-depth manner. The rationale for using this design was that the study seeks to assess effects of perceived science teachers' classroom behaviours on the academic performance of SHS science students.

B. Sample and Sampling Procedure

The sample size consisted of 72 third year elective science students drawn from six (6) SHS in the Central and Ashanti Regions of Ghana. The 72 students were made up of 37 boys and 35 girls. A purposive sampling procedure of the non-probability sampling was used to select the sample. The 3rd year students were used for the study because they have been studying science in school for the past two-and-half years and they might have in-depth and better knowledge about the behaviours exhibited by their science teachers in the science classrooms.

C. Research Instruments

The study employed both quantitative and qualitative data-gathering instruments. Interview and questionnaire were the two (2) instruments used to collect data from the respondents. The science teachers' perceived classroom behaviour questionnaire (STPBCQ) and science teachers' perceived classroom behaviour interview guide (STPBIG) were used to collect data from the respondents.

D. Data Collection Procedure

Permission was sought from the school authorities, teachers and students of the selected schools to carry out the study. In all, two (2) weeks were used to collect the data from the respondents. Questionnaires (STPBCQ) were administered

to the students to answer in my presence. All the 72 questionnaires were collected and this process ensured 100% retrieval rate. Again, the researcher had face-to-face individual interview sessions with only 18 SHS science students (3 students each from the 6 selected SHS). The interview session for each student lasted for 3 - 10 minutes.

E. Data Analysis Method

Both quantitative and qualitative methods of data analysis were employed in the study. Data from the STPBCQ were analysed quantitatively using descriptive statistics mainly frequency and percentage. Data from the STPBIG were analysed qualitatively and summarised thematically.

IV. RESULTS AND DISCUSSION

A. Analysis of the Results

The analyses of the results were done to answer the 3 research questions posed by the study.

B. Research Question

1: *What behaviour characteristics are perceived to be exhibited by science teachers in the science classroom?*

In answering research question 1, the students' responses to questions (1-12) in the STPBCQ were analysed quantitatively using frequency and percentage and are presented in Table 1 below:

Table 1. Behaviour Characteristics Exhibited By SHS Science Teachers

No	Science teachers' classroom behaviours.	Yes		No		Total	%
		F	%	F	%		
1.	Science class afraid of some science teacher.	60	83.3	12	16.7	72	100
2.	Teacher offers words of encouragement.	1	1.4	71	98.6	72	100
3.	Teacher talks enthusiastically about his/her work and maintains students' discipline in class.	59	81.9	13	18.1	72	100
4.	Science teacher is quick tempered and changes his/her mood quickly.	67	93.1	5	6.9	72	100
5.	The whole class laugh with teacher during lessons.	10	13.9	62	86.1	72	100
6.	Teacher is able to accept the feelings of students.	18	25.0	54	75.0	72	100
7.	Science teacher attempts to find solutions for the reported problems by the students.	16	22.2	56	77.8	72	100
8.	Teacher prepares an atmosphere for students to express their thoughts and feelings freely.	6	8.3	66	91.7	72	100
9.	Science teacher gives class work to enhance learning and announce tests in advance.	64	88.9	8	11.1	72	100
10.	Science teacher is aware that it is normal for students to make mistakes during their learning.	11	15.3	61	84.7	72	100
11.	Science teacher willing to explain things to student again in class.	12	16.7	60	83.3	72	100
12.	Moves around in the classroom when teaching.	2	2.7	70	97.2	72	100

Source: (Students' STPBCQ, 2018); F = Frequency

From the responses in Table 1, it is clear that science teachers exhibit several behaviours in the science classroom. Majority of the students (67 out of 72) representing 93.1% agreed that their science teachers were quick tempered and changed their mood quickly. Again, 60 students representing 83.3% agreed that the science classes were afraid of some of the science teachers.

When asked if science teacher talks enthusiastically about his/her work and maintains students' discipline in class; as many as 59 students representing 81.9% responded "Yes"

with only 13 students indicated “No” to the same statement. On the issue of whether science teacher gives class work to enhance learning and announce tests in advance; as many as 64 students representing 88.9% indicated “Yes” while only 8 students representing 11.1% responded “No” to the same statement.

When asked if the science teacher moves around in the classroom when teaching; almost all the students (70 out of 72) representing 97.2% indicated “No” whereas only 2 students representing 2.7% responded “Yes” to the same item. On the issue of whether science teacher offers words of encouragement, almost all the students (71 out of 72) representing 98.6 % disagreed while only 1 student representing 1.4% agreed to the same statement.

C. Research Question 2: What are the science students’ perceptions of their science teachers’ behaviours in classroom?.

In answering research question 2, the respondents’ responses to question items (13-20) in the STPBCQ were analysed using frequency and percentage and are presented in Table 2 below:

Table 2. Science Students’ Perceptions of Teachers’ Behaviour

No	Students’ perceptions of teacher behaviour	Yes		No		Total	%
		F	%	F	%		
13.	Do you think your science teacher is friendly?	12	16.7	60	83.3	72	100
14.	Is your science teacher impatient?	61	84.7	11	15.3	72	100
15.	Does your science teacher really love you?	16	22.2	56	77.8	72	100
16.	Is your science teacher firm and strict?	70	97.2	2	2.7	72	100
17.	Is your science teacher unwilling to answer students’ questions?	62	86.1	10	13.9	72	100
18.	Is your science teacher takes a joke easily?	3	4.2	69	95.8	72	100
19.	Is your science teacher “gender bias” and has “teacher’s pets” in class?.	66	91.7	6	8.3	72	100
20.	Science teacher acts respectfully, honestly and kindly to the students.	4	5.6	68	94.4	72	100

Source: (Students’ STPBCQ, 2018); F = Frequency

Data in Table 2 shows that the science students’ perceptions of their science teachers’ behaviours were not very impressive. Majority of the students (70 out of 72) representing 97.2% agreed that their science teachers were strict and firm while 2 students representing 2.7% disagreed

to the same statement. Also, as many as 60 students representing 83.3% agreed that science teachers were not friendly while only 12 students representing 16.7% disagreed to the same item.

Again, as many as 61 students representing 84.7% agreed that science teachers were impatient with only 11 of them representing 15.3% disagreed to the same item. Also, majority (62 out of 72) of the students representing 86.1% responded “Yes” to the statement that science teachers were unwilling to answer students’ questions while only 10 students representing 13.9% indicated “No”.

When asked if science teacher acts respectfully, honestly and kindly to students; as many 68 students representing 94.4% indicated “No” whereas only 4 students representing 5.6% responded “Yes” to the same item. Again, on the issue of whether science teacher was “gender bias” and had “teacher’s pets” in class; as many as 66 students representing 91.7% responded “Yes” with only 6 students representing 8.3% responded “No” to the same statement.

D. Research Question 3: How does the perceived science teacher’s behaviours affect the academic performance of the students in the science classroom?

In answering research question 3, respondents’ responses to question items (21-25) in the STPBCQ were analysed using frequency and percentage and are presented in Table 3 below:

Table 3. Effects of Teacher’s Behaviour on Students’ Academic Performance

No	Effects of teacher’s behaviours on performance	Yes		No		Total	%
		F	%	F	%		
21.	Does your science teacher’s behaviour affect your learning of science in school?	61	84.7	11	15.2	72	100
22.	Teacher listens attentively to student questions.	16	22.2	56	77.8	72	100
23.	Science teacher provides extra teaching to help weak students after normal class hours.	48	66.7	24	33.3	72	100
24.	Teacher’s behaviour makes you like science in school?	6	8.3	66	91.7	72	100
25.	Teacher’s behaviour negatively affects my academic performance in school science?	69	95.8	3	4.2	72	100

Source: (Students’ STPBCQ, 2018); F = Frequency

Result in Table 3 shows that, as many as 69 students representing 95.8% agreed that science teacher’s behaviours

negatively affects their academic performance whereas only 3 students representing 4.2% disagreed to the same statement. Again, majority (66 out of 72) of students representing 91.7% disagreed that teacher's behaviour makes them like science in school while only 6 students representing 8.3% agreed to the statement.

When asked whether science teacher's behaviour affect their learning of science in school; as many as 61 students representing 84.7% responded "Yes" while only 11 students representing 15.2% responded "No" to the same item.

During the interview sessions, very interesting responses were revealed. When asked what might have accounted for the poor performance among the students in science; majority of the interviewees were of the conviction that, the relationship between them and some of the science teachers were not the best. Students reported that most of their science teachers were quick tempered, unfriendly, unloving, unaccommodating, non-humorous, too strict and unresponsive to their needs and aspirations. They also revealed that the teaching atmosphere in most of the science classes were very hostile, threatening and full of insults.

When asked which group of science teachers often exhibit inappropriate behaviours in school; majority of the interviewees vehemently indicated that the young science teachers often exhibited inappropriate behaviours. When asked further which category of young science teachers (males or females) exhibit inappropriate behaviours; almost all the interviewees indicated that the young female science teachers. Most of the students said apart from insults, most of young female science teachers simply brush them off whenever they ask questions during lessons.

E. Discussion of the Results

The results of this study showed that science teachers were perceived to exhibit several behaviour characteristics during science lessons. Most students (67; 93.1%) agreed that their science teachers were quick tempered and changed their mood very quickly. Again, most students (60; 83.3%) vehemently agreed that the science classes were afraid of some of the science teachers. This finding contradicts the results of Goodman (2016) that in general, effective teachers are those who often help students learn best and they always had a smile on their face.

Also, majority of the students (70; 97.2%) agreed that science teachers did not move around in the classrooms during science lessons. This finding is in disagreement with the results of (Evertson, 1995; Goodman, 2016) that students' learning is increased when science teacher moves around the classroom to monitor students' seatwork in the classroom.

Again, almost all the students (71; 98.6%) agreed that science teachers did not offer words of encouragement to them during lessons. This finding is in agreement with the result of Sezgen (1988) that ineffective teachers are irrelevant and do not motivate students.

Reflections of the students' responses also revealed that most of the students (59; 81.9%) agreed that science teachers

talk enthusiastically about their profession and were able to maintain students' discipline in class. Also, it was observed that most science teachers gave class work and also announced tests in advance. This finding lends credence to the results of Borich (2004) that effective teacher gives class work, announce tests in advance and are enthusiastic about the subject being taught.

The results also revealed that most of the science teachers were unfriendly; impatient; too strict; unloving; disrespectfully, dishonest and unkind to the students. These findings contradict the results of (Tuncel, 2009; Goodman, 2016) that effective teacher is expected to be patient, committed to students' welfare; firm but strict; loving; respectful, honest and kind with positive attitudes.

Again, majority of the students (62; 86.1%) indicated that science teachers were unwilling to answer their questions; and that most of the students (66; 91.7%) agreed that majority of science teachers were gender bias and had teacher's pets in class. These findings are against the results of (Konti, 2011) that a science teacher should be willing enough to answer students' questions; and he/she should not be gender bias.

The results also revealed that science teachers' inappropriate classroom behaviours had impacted negatively on students' academic performance and learning of science. Also, during the interview session, the poor academic performance among students was attributed to the poor teacher-student relationship. This finding lends credence to the results of Koul and Fisher (2004) that students with caring, supporting interpersonal relationship, and effective teachers with good behaviours have more positive academic performance, attitudes and satisfaction in schools.

One significant finding was that teaching atmosphere in most of the science classes was very hostile, threatening and full of insults. Another significant finding was that young science teachers exhibited inappropriate behaviours; with the young female science teachers usually exhibited the most inappropriate behaviours in science classrooms. This finding lends credence to the results of pioneer researchers (Harding, 1996; Ajaja & Eravwoke, 2013) that there is a significant difference in classroom behaviours of science teachers between males and females; with males demonstrating appropriate behaviours characteristics than that of the female teachers.

V. CONCLUSIONS

Based on the findings of the study, it can be concluded that;

- Majority of science teachers were quick tempered and they changed their mood very quickly; they did not move around in the classrooms during science lessons; and that they did not offer words of encouragement to students during science lessons.
- Majority science teachers talk enthusiastically about their profession and were able to maintain students' discipline in class. Also, most science teachers gave class work to

enhance students' learning and also announced tests and quizzes in advance for students to prepare.

- Science students' perceptions of their science teachers' behaviours in science classrooms were not impressive; and that most science teachers were perceived to be unfriendly; impatient; too strict; unloving; disrespectful, dishonest and unkind to the students. Also, science teachers were unwilling to answer students' questions; gender bias and had teacher's pets in class.
- Science teachers' inappropriate classroom behaviour characteristics had impacted negatively on the students' academic performance and learning of science in schools.
- Poor academic performance among students was attributed to bad teacher-student relationship; and that teaching atmosphere in most science classes was hostile, threatening and full of insults.
- Young science teachers exhibited inappropriate behaviours and that the young female science teachers usually exhibited the most inappropriate behaviour characteristics in classrooms.

A. Recommendations

Based on the major findings and conclusions drawn from the study, it is recommended that:

- Science teachers should put up good and appropriate behaviour characteristics such as intermittent smile; set rules with clear consequences; follow through; teach detailed routines and add a dose of fun to help improve students' performance and attitudes towards science.
- The head masters, heads of department and other stakeholders in science education should intensify their supervisory roles so as to check and curtail some of the inappropriate behaviour exhibited by science teachers in their science classrooms.

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