

## **Original Research Article**

### **STUDENTS' PERCEPTION OF THEIR PHYSICS TEACHERS' CLASSROOM PRACTICES**

#### **Abstract**

The purpose of the study was to investigate students' perception of their physics teachers' classroom practices. The study was conducted in eight (8) senior high schools in the Hohoe Municipality in the Volta Region of Ghana. Descriptive cross-sectional survey design was employed in carrying out the study. A total sample of 200 senior high school physics students were involved in the study. A questionnaire consisting mainly of closed ended items was used in collecting data from respondents. Data collected was analysed using frequencies, percentages, mean and standard deviation. It was found that physics teachers do not often motivate students and make them appreciate the fact that the things they learn in physics are important. Based on the findings, it was recommended that physics teachers make learning of physics interesting by making students appreciate the importance of what they teach, often encourage students to study physics and also show interest in the overall success of their students.

**Keywords:** Classroom Practices, Students' Perception, Physics teacher

#### **1.0 INTRODUCTION**

The problem of poor academic performance in science especially physics among Senior High Schools students is evident from the various reports released yearly by the West African Examination Councils' chief examiner. Common among these reports is the continuous emphasis on the weaknesses of the students which contributes to their failure. Most of the reports talk of students as either performing averagely or worse compared to the previous years. The following are some of the reported weaknesses of students during the recent West Africa Secondary Schools Certificate Examination (WASSCE) by the chief examiner.

1. Incorrect definition of scientific terms;
2. Quoting inappropriate formula to solve mathematical problems;
3. Stating incorrect scientific laws.
4. Candidates generally exhibited lack of understanding and application of concepts principles and phenomena.
5. Many of the responses provided were poor, indicating that candidates did not treat many topics or did not revise adequately before taking the examination.
6. Some candidates lacked knowledge of some theories in Physics
7. Units were mixed up and calculations were not carried out in SI unit by some candidates.
8. Candidates have difficulty with calculations in mechanics and heat. (WAEC, 2011, 2013, 2018)

There is therefore the need to identify the causes of the problem of poor academic performance among physics students at the senior high school level. It is believed that students perception about their teacher has an influence on their self-concept towards this teacher and the subject(s) he teaches and eventually affect students' academic performance at large (Ibrahim, 2014). It is clear that when students are pleased with the classroom practices of their physics teachers they are bound to give positive comments on their teachers' classroom practices. Also, when students are pleased with the classroom practices of their teachers, they are likely to actively participate in the teaching and learning process in the classroom. Students active participation in class will have a positive influence on their academic performance. A study conducted by Langat (2018) found out that teachers' commitment, preparedness and challenges faced by Physics teachers which are some characteristics of their classroom practices were found to be influencing academic performance of Senior High School Physics students. Also, Akram (2019) is of the view that students' perceptions of how effective their teachers are in teaching will be significant in helping teachers revise their teaching strategies with the aim of improving students' academic performance. The various findings have revealed the existence of a relationship between students' perception, teachers' practices and students' academic performance. It is against this backdrop that this study seeks to explore the perceptions of Physics students concerning their physics teachers' classroom practices. This action is in attempt to ascertain how the classroom practices of physics teachers contributes to students' perception and academic performance. The

classroom practices of teachers in this study is centered motivation of Physics students and on the pedagogical skills employed by teachers in the classroom.

## **2.0 LITERATURE REVIEW**

### **2.1 Concept of Students' Perception**

According to Haman et al. (2012), perception is an individual's evaluation of real-world events. A way individuals evaluate people with whom they are familiar in everyday life. Eggen and Kauchak (2002) gave cognitive dimension of perception; they see perception as the process by which people attach meaning to experiences. According to Ou (2017), perception is a process and consists of three stages namely, selection, organization and interpretation. At the selection stage, one convert stimuli from the environment into meaningful experience. During the organization stage, one finds certain meaningful patterns and organize our experiences by putting things or people into categories. one finally attach meaning to the selected stimuli at the Interpretation stage. Fundamental to perception is that, there is an experiencing person (perceiver) secondly, something is being perceived (either an object, person, situation or relationship); thirdly, there is the context of the situation in which objects, events or persons are perceived and finally, there is the process nature of perception starting with the experiencing of multiple stimuli by the senses and ending with the formation of precepts.

From the researchers' point of view, perception can simply be defined as an individual's interpretation of the information gathered through the senses about an object, person, situation or relationship. Specifically, students' perception of their teacher's classroom practices can be defined as students' interpretation of their teacher's actions or practices to ensure effective teaching and learning in the classroom. It is a common opinion held by students concerning the teaching and learning activities facilitated by their teacher in the classroom. Students' perception of teachers' knowledge of subject matter, attitudes to work and teaching skills is absolutely dependent on the fact that they have been taught by the teachers under evaluation and are familiar with them. (Anne, Ndurumo & Kisilu, 2013). Generally, perceptions of students eventually form part of their beliefs which in turn can influence their career choices (Ferreira & Santoso 2008; Hunt et al., 2004; White & White, 2006).

## **2.2 Students' Perceptions of their Teachers' Classroom Practices**

Students' individual experiences and opinions are partly shaped by the shared events in the classroom. Teachers should therefore not underestimate their teaching style, attitude and behaviour in class because most students express concern about their teachers' attitude, behaviour and other classroom activities (Ampadu, 2012). Students usually assess teachers by their ability of communication, the methods of teaching and the contents of the subject they teach. Students expressing negative concern could go a long way to affect their attitude towards the teacher and the subject.

The perception of student toward the education process relatively impacts the decision of the students in the institution. Indirectly, the positive perception of students towards learning in the educational process will offer the benefit for higher academic success rate for the students (Gul, Ince & Turan, 2011). Research on students' perception has received much attention over the years as students' opinion are sought on many aspects of the teaching and learning process. Seeking students' opinion on issues concerning teaching and learning is very crucial and a step in the right direction because, students tend to be the direct beneficiaries of most of the activities facilitated by the teacher in the classroom. Ahmed and Aziz (2009) argued that collecting information from students regarding their teachers' teaching provides meaningful data on what their teacher does. Ahmed and Aziz further noted that students' perception of their teacher's teaching contribute very much in improving the teaching and learning of the subject as it provides valuable suggestions and directions for their teacher's future improvement (Ahmed & Aziz, 2009). In support of the argument made by Ahmed and Aziz, assessing teachers teaching practices using students' ratings and feedback according to Arthur, Tubre, Paul and Edens (2003) has proved to be reliable, variable and one of the best methods of measuring teachers' instructional practices. In addition, Arthur et. al. (2003) are of the opinion that the current system of assessing teachers by examining their own perceptions of their teaching is neither reliable nor valid, since it most often considers students' views as unimportant although students are directly affected by the teacher's actions and inactions. Also, Ampadu (2012) in a study found that students were in a better position to provide useful information regarding their teachers' teaching and how that impacts on their learning. Also, Fogarty & Hogan (2009)

maintained that collecting and estimating the perception of students is an effective procedure in evaluating the quality of the learning process.

Negative perceptions of students have influence on their performance in Physics courses as confirmed by Bamidele (2001) who reported that students' lack of interest in physics is due to their perception that physics is a difficult subject. In a similar study carried out with the purpose of examining the perception of undergraduate students towards their teachers, it was found that all the students did not feel good about some of their teachers' behaviour and attitude when they taught their students (Jasia, Nurul & Sarif, 2018). Saleem & Qureshi (2011) found that perception of students about teaching and learning may be a factors that can influence students' academic performance which includes the involvement of the students in the class and information the students know about the subject. The study done by Leeson, Ciarrochi & Heaven (2008) also revealed that there was significant relationship with the students' positive perceptions in learning towards their academic performance. Ferreira, Aldónio and Santoso, Andrijani (2008), studied the effect of students' perceptions on academic performance. The study involved undergraduate and graduate students enrolled in management accounting subjects. Findings indicate that students' performance is negatively affected by the negative perceptions students of accounting subject students have. It was further revealed that positive perceptions of accounting held by students at the end of the semester have a positive impact on students' performance. It was revealed in a similar study that there exist a significant ( $P < 0.05$ ) effect of perception towards performance in Mathematics among students. Female students had negative perception towards Mathematics. Most of the female students with negative perception performed poorly in Mathematics. Female students' in boarding schools were established to have more positive perceptions towards Mathematics and therefore performed better in the subject than students from co-educational schools. This tends to suggest that students' performance will largely be shaped by their perception to Mathematics. However, good academically the student is, the perception creates an impetus into the student's mind which creates a culture to like or dislike the subject. When these students' perceptions are not strengthened towards an undertaking, they often don't do quite well academically, even though they have the ability to do well under conducive environment. The researchers therefore concluded that performance of Mathematics can be improved through enhancing positive perception towards Mathematics. (Anne, Ndurumo & Kisilu, 2013) It must be noted that the more interest students develop for a

subject, the higher grades they will get. Rohana, Nor Rashidah & Zaidi (2009) maintained that to achieve a good academic performance, the perception of students is significant as well as the involvement of teachers in students' study. On the contrary, Akkoyunlu & Soylu (2008) argued that there was no significant difference between students' achievement and their learning styles developed with their own perceptions in order to make efficient learning to occur learning styles.

Previous research shows that students' negative perceptions about a particular subject are likely to affect their interest for the subject. (Hunt et al., 2004; Parker, 2000; Siegel, 2000; Wessels & Steenkamp, 2009; Ferreira & Santoso, 2008). Empirical review (Ampadu, 2012; Bamidele, 2001) has also revealed the need to pay attention to students' perception. It has also been revealed from literature (Ahmed & Aziz, 2009; Arthur et. al., 2003) that seeking students' opinion on issues concerning teaching and learning is very crucial and a step in the right direction because, students tend to be the direct beneficiaries of most of the activities facilitated by the teacher in the classroom.

### **3.0 RESEARCH METHODOLOGY**

#### **3.1 Research Design**

Descriptive survey design specifically, cross-sectional survey was employed in carrying out the study. Using cross-sectional survey design, the researcher collects data at one point in time. The design has the advantage of enabling the researcher measure current attitudes or practices (Creswell, 2012). Surveys enable researchers gather data on a one-shot basis and hence it is economical and efficient (Cohen, Manion & Morrison, 2018). Such an approach does not involve the manipulation of variables in the study.

#### **3.2 Population of the Study**

In this study, the target population was made up of all senior high school elective physics students in the Hohoe Municipality in the Volta Region of Ghana. The Hohoe municipality can boast of about eight (8) Senior High Schools. Classroom practices of physics teachers is similar in all parts (regions) of the country but Hohoe municipality was randomly selected as a case to represent what prevails in others parts of the country.

### **3.3 Sample and Sampling Procedure**

In this study, the sample was randomly selected from the portion of the accessible population using random cluster sampling. Random cluster sampling was used to select a class of 25 students from each of the 8 senior high schools in the municipality. The sample size was made of a total on 200 second year physics students.

### **3.4 Research Instrument**

In this study, questionnaire was employed to collect data for the study. The questionnaire was used to gather data from the students on their perception concerning their physics teachers' classroom practices. A five-point Likert scale format consisting of Always (A), Often (O), Never (N), Sometimes (S), Rarely (R) was used to help students respond to the items on the questionnaire.

### **3.5 Validity and Reliability of Research Instruments**

The instruments were also validated through content validity using expert judgement. Content validity refers to the degree to which the sample of the items represents the content that it is designed to measure. (Orodho, 2009). According to Creswell (2012), content validity is the extent to which the questions on the instrument and the scores from these questions are representative of all the possible questions that could be asked about the content or skills. The Researcher assessed content validity through the use of professionals in the field of science (physics) education on whether the instruments accurately represent the concept of the study. Their ideas were well considered and appropriately incorporated. The instrument was also pilot tested. Piloting is important because it helps in revealing deficiencies in a research instrument such as questionnaire (Mugenda & Mugenda, 2003). The researcher then addressed the deficiencies revealed by the piloting exercise.

There are a number of different aspects to reliability. One of the aspects is to check for internal consistency. Internal consistency refers to the degree to which items that makes up a scale “hang together” or measure the same underlining construct (Pallant, 2007). Cronbach's alpha coefficient was used to check the reliability of the items on the questionnaire. According to DeVellis (2003), Cronbach's alpha coefficient of a scale should be above 0.7. A sample size of 200 students from the pilot study yielded a Cronbach's alpha coefficient value of 0.953.

### 3.6 Data Analysis

In analysing the data on the questionnaire, values of 1 to 5 was assigned to the Likert scale format (i.e. 5-Always, 4-Often, 3-Sometimes, 2- Rarely and 1-Never). A midpoint values of three (3) was chosen which indicate that, for each item answered, an average value above three (3) obtained was considered as a positive opinion or perception and mean values below 3 obtain was considered negative opinion or perception. Data collected was analysed using statistical tools such as frequencies, percentages, mean and standard deviation.

## 4.0 RESULTS AND FINDINGS

### 4.1 Demographic Data of Respondents

The study involved a total of 200 second year senior high school physics students in the Hohoe Municipality of the Volta Region. These students were selected from 8 different senior high schools. Out of the 200 respondents, 163 (81.5%) were males and 37 (18.5%) were females. Majority 157 (78.5%) of the student respondents were between the ages of 16 to 18 years, 33 (16.5%) were in the 19 to 22 years' age range whiles six of the student respondents were in the 13 to 15 years' age range. The details of the age distribution of student respondents are presented in Table 1.

Table 1: Demographic data of respondents

Demographic Data	Frequency	Percentage (%)
<b>Age(in years)</b>		
13-15	6	3.0
16-18	157	78.5
19-21	33	16.5
Above-22	4	2.0
<b>Sex</b>		
Male	163	81.5
Female	37	18.5

*Field Data, 2021.*



#### 4.2 Research Question: What is the Perception of Students of their Physics Teachers' Classroom Practices?

Presented in Table 2 and Table 3 are the results obtained from students on their opinion of their physics teachers' classroom practices. The results were present using descriptive statistics such as frequency, percentages, mean and standard deviation. In analysing the data on the questionnaire, values of 1 to 5 was assigned to the Likert scale format (i.e. 5-Always, 4-Often, 3-Sometimes, 2- Rarely and 1-Never). A midpoint values of three (3) was chosen which indicate that, for each item answered, an average value above three (3) obtained was considered as a positive opinion or perception and mean values below 3 obtain was considered negative opinion or perception.

Table 2: Students' perception of their physics teachers' classroom practices

Items	Mean	Standard Deviation
1. My physics teacher teaches in a way that helps me to learn effectively	2.62	1.006
2. My physics teacher helps me understand that things we learn in physics are important	2.55	0.912
3. My physics teacher gives clear explanation and directions	2.61	0.939
4. My physics teacher shows interest in my academic progress and success in life	2.52	1.017
5. My physics teacher makes me more interested in studying physics	2.73	1.064
6. My physics teacher encourages me enough to study physics	2.55	0.923
7. My physics teacher uses the appropriate teaching and learning materials	2.84	1.215

Table 3: Students' perception of their physics teachers' classroom practices

Items	AL	O	S	R	N
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	f(%)	f(%)	f(%)	f(%)	f(%)
1. teaches in a way that helps me to learn effectively	7(3.5)	44(22)	26(13)	111(55.5)	12(6.0)
2. helps me understand that things we learn in physics are important	7(3.5)	30(15)	35(17.5)	121(60.5)	7(3.5)
3. gives clear explanation and directions	6(3)	37(18.5)	39(19.5)	109(54.5)	9(4.5)
4. shows interest in my academic progress and success in life	8(4)	39(19.5)	17(8.5)	121(60.5)	15(7.5)
5. makes me more interested in studying physics	7(3.5)	56(28)	29(14.5)	92(46)	16(8.0)
6. encourages me enough to study physics	5(2.5)	35(17.5)	35(17.5)	115(57.5)	10(5.0)
7. uses the appropriate teaching and learning materials	16(8)	58(29)	30(15)	69(34.5)	27(13.5)

*Field data, 2021. Key: Always (A), Often (O), Never (N), Sometimes (S), Rarely (R)*

Most of the students did not have good perception about their physics teachers' teaching (Grand Mean = 2.57). Only seven (7) out of the 200 students revealed that, their physics teachers' teaching always makes them more interested in studying physics (Mean = 2.73, SD = 1.064), their teachers teach in a way that helps them to learn effectively (Mean = 2.62, SD = 1.006), and makes them appreciate the fact that the things they learn in physics are important (Mean = 2.55, SD = 0.912). Most students are generally not satisfied with the teaching and learning materials used by their physics as 69(34.5%) and 30(15%) are of the opinion that their physics teachers rarely and sometimes use the appropriate teaching and learning materials during physics lessons respectively. Also worth noting is the widely held notion by most physics students 121(60.5%) that their physics teachers are often not showing interested in their academic progress and success in life. Table 3 also revealed that students are not often encouraged enough to study physics. This is evident from the results displayed in Table 3 which shows that 35(17.5%) of

physics students are often encouraged to study physics whilst only 5 (2.5%) of the physics students are always motivated to study physics.

#### **4.3 Key findings:**

- i. Majority of students (60.5%) held a negative perception about their physics teachers' interest in their academic progress.
- ii. Most students 57.5% expressed concern about their physics teachers' inability to regularly motivate them to study physics. Only 2.5% and 17.5% of the students mentioned that their physics teachers always and often encourage them to study physics respectively.
- iii. Quite a large majority 60.5% of the students reported that their physics teachers do not emphasise the importance of the physics concepts they teach in class.
- iv. More than half of the students 63% were of the view that their physics teachers do not use the appropriate teaching and learning materials in teaching them.

#### **5.0 DISCUSSION OF FINDINGS**

A greater proportion of the physics students held a negative perception about their physics teachers' classroom practices. Findings from the study revealed that physics teachers are not showing interest in their students' academic progress and are not always teaching in a way that helps students to learn effectively. Physics students also expressed negative opinion with regards to their physics teachers' knowledge of the subject matter. Generally, students have expressed negative opinion with regards to their physics teachers' motivation of students to study physics. Consistent with this finding, is that of Jasia, Nurul and Sarif, (2018). In a similar study they carried out with the purpose of examining the perception of undergraduate students about their teachers' teaching, it was found that all the students didn't feel good at some of their teachers' behaviour and attitude when they teach. Perceptions of students according to Ampadu (2012) are shaped by the shared events in the classroom. Ahmed and Aziz further noted that students' perception of their teacher's teaching contribute very much in improving the teaching and learning of the subject as it provides valuable suggestions and directions for their teacher's future improvement (Ahmed & Aziz, 2009). Negative perceptions of students have equally negative influence on their performance in physics courses as confirmed by Bamidele (2001) who

reported that students' lack of interest in physics is due to their perception that physics is a difficult subject. It is therefore a wakeup call for physics teachers not to underestimate their teaching style, attitude and behaviour in class as this could go a long way to influence students' perception and affect their academic performance (Ampadu, 2012).

## **6.0 CONCLUSION**

Generally, students have expressed negative perception about their physics teachers' classroom practices. Unfortunately, negative perception of students could result in an equally negative influence on their attitude towards the teacher, the subject and on their performance in the subject taught by the teacher. However, students having negative perception of their physics teachers' practices does not necessarily lead to the conclusion that their physics teachers are incompetent in performing their duties. Aside teacher-related factors, there could be underlying students-related factors contributing to the negative perception. Irrespective of the causes of students' negative perception, the teacher has the responsibility to ensure that, students enter the physics classroom with a positive attitude and perception. Students' perception of their teacher's teaching contribute very much in improving the teaching and learning of the subject as it provides valuable suggestions and directions for their teacher's future improvement. Physics teachers must therefore make a conscious effort to help students develop and maintain a positive opinion about their teacher's teaching.

The findings of this study should serve as a wake-up call for physics teachers in the Hohoe municipality and all other physics teachers not to underestimate their teaching style, attitude and behaviour in class as this could go a long way to influence students' perception and affect their academic performance.

### **Disclaimer**

This paper is an extended version of a Thesis document of the same author.

The Thesis document is available in this link: [https://www.researchgate.net/figure/Students-responses-about-teaching-approaches\\_fig1\\_274254403](https://www.researchgate.net/figure/Students-responses-about-teaching-approaches_fig1_274254403)

[As per journal policy, pre-print article can be published as a journal article, provided it is not published in any other journal]

## 7.0 RECOMMENDATIONS

1. Physics teachers should carefully examine their activities in the classroom and avoid practices that contributes to students' negative perception.
2. Physics teachers must make learning of physics interesting by making students appreciate the importance of what they teach to encourage students to study physics.
3. Physics teachers must show interest in the performance and overall success of their students.

## REFERENCES

- Ahmad, F., & Aziz, J. (2009) Students' perception of their teachers' teaching of literature communicating and understanding through the eyes of the audience *European Journal of Social Science*, 7(3), 17-26.
- Akram, M. (2019). Relationship between Students' Perceptions of Teacher Effectiveness and Student Achievement at Secondary School Level. *Bulletin of Education and Research* 41(2), 93-108.
- Akkoyunlu, B., & Soylu, M. Y. (2008). A study of student's perceptions in a blended learning environment based on different learning styles. *Educational Technology & Society*, 11(1), 183-193.
- Ampadu, E. (2012) Students' perceptions of their teachers' teaching of mathematics: The case of Ghana. *International Online Journal of Educational Sciences*, 4 (2), 351-358.
- Anne, W., Ndurumo, M., & Kisilu, K. J, (2013) The impact of perception on performance in mathematics of female students in secondary schools in Teso District, Kenya. *Journal of Education and Practice*, 4(20), 104 – 110.
- Arthur, W., Tubre, T., Paul, D. S., & Edens, P. S. (2003) Teaching effectiveness: The relationship between reactions and learning evaluation criteria. *Educational Psychology*, 23(3), 275-285.
- Bamidele, O. M. F. (2001). *Promoting Science and Mathematics Education amongst females in Nigeria* [Workshop presentation]. NCCE/UNESCO 5-Day Train the Trainer Workshop for The revitalization of science Education, Nigeria.
- Cohen, L., Manion, L., & Morrison, K. (2018). *Research methods in education* (8th ed.). Routledge.
- Creswell, J. W. (2012) Educational research: Planning, conducting and evaluating quantitative and qualitative research (4th ed.). Pearson Education, Inc.
- DeVellis, R.F. (2003). *Scale development: Theory and applications* (2nd ed.). Sage.
- Engen, P., & Kauchak, D. (2002). *Strategies for teachers: Teaching content and thinking skills* (4th ed.). Allyn and Bacon.

- Ferreira, A., & Santoso, A. (2008). Do Students Perceptions Matter? A Study of the effect of students' perceptions on academic performance. *Accounting & Finance*, 48 (2), 209-231.
- Fogarty, T. J., & Hogan, B. (2009). Student Perceptions of Faculty Instructional Value-Added: A New Measure and Exploratory Empirical Evidence. *Global Perspective on Accounting Education*, 6, 53-76.
- Gül, H., İnce, M., & Turan, A. (2011). University students' quality expectations from academics: The case of the Karamanoğlu Mehmetbey University. *European Journal of Economics, Finance and Administrative Sciences*, (30), 21-27.
- Haman, J., Birt, J., Donald, J., & Allen, E. (2012). *Post-graduate and under-graduate accounting students: are their differences in expectations and perceptions about learning?* [Unpublished research]. Monash University.
- Hunt, S., & Falgiani, A., & Intrieri, R. (2004). The nature and origins of students' perceptions of accountants. *The Journal of Education for Business*, 79(3), 142-148.
- Ibrahim, A. (2014). The students' perception of teachers' classroom effectiveness on their self-concepts in Lagos Metropolis. *Journal of Teaching and Teacher Education*, 2 (2), 133-141.
- Jasia, M., Nurul, M. Z., & Sarif, I. (2018) Students' perception towards their teachers' behaviour: a case study on the undergraduate students of daffodil international University, Dhaka, Bangladesh", *International Journal of Development Research*, 8(10), 387-392.
- Langat, K. (2018). Teacher factors influencing academic performance of secondary school students in Physics: A study of secondary schools in Bureti Sub County [Unpublished master's thesis]. Moi University.
- Leeson, P., Ciarrochi, J., & Heaven, P. C. L. (2008). Cognitive ability, personality, and academic performance in adolescence. *Personality & Individual Differences*, 45(7), 630-635.
- Mugenda, O., & Mugenda, A. (2003). *Research methods: Quantitative and qualitative approaches*. Acts Press.
- Orodho, J. (2009). *Elements of education and social science research methods*. Kaneja HP Enterprises.
- Ou, Q. (2017). A brief introduction to perception. *Studies in Literature and Language*, 15 (4), 18-28. <http://dx.doi.org/10.3968/10055>
- Pallant, J. (2007). *SPSS survival manual: A step by step guide to data analysis using SPSS* (3<sup>rd</sup> ed.). Open University Press.
- Parker, L. (2000). Goodbye, number cruncher! *Australian CPA*, 77(2), 50-52.
- Rohana K., Nor Rashidah Z., & Zaidi Mohd A. (2009). The quality of learning environment and academic performance from a student's perception. *International Journal of Business and Management*, 4 (4), 171 – 175.

- Saleem, M. A., & Qureshi, M. I. (2011). Credentials and examination of the factors affecting the students' academic achievement in higher education. *Gomal University Journal of Research*, 27(2), 74-80.
- Siegel, G. (2000). The image of corporate accountants. *Strategic Finance*, 82(2), 71-72.
- West African Examination Council (WAEC). (2011). *Chief Examiners Report on Secondary School Certificate Examination*. WAEC Press.  
<https://www.waecgh.org/uploads/examinersReport/2011/Science.pdf>
- West African Examination Council (WAEC). (2013). *Chief Examiners Report on Secondary School Certificate Examination*. WAEC Press.  
<https://www.waecgh.org/uploads/examinersReport/2013/Science.pdf>
- West African Examination Council (WAEC). (2018). *Chief Examiners Report on Secondary School Certificate Examination*. WAEC Press.  
<https://www.waecgh.org/uploads/examinersReport/2018/Science.pdf>
- Wessels, P. L., & Steenkamp, L. P. (2009). An investigation into students' perceptions of accountants. *Meditari Accountancy Research*, 17(1), 117-132.
- White, G. B., & White, M. J. (2006). Perceptions of accountants: what are they after Enron and World Com? *Journal of College Teaching and Learning*, 3(11), 71-76.