



Journal Homepage: -www.journalijar.com
**INTERNATIONAL JOURNAL OF
 ADVANCED RESEARCH (IJAR)**

Article DOI:10.21474/IJAR01/7135
 DOI URL: <http://dx.doi.org/10.21474/IJAR01/7135>



RESEARCH ARTICLE

**TEACHERS' CLASSROOM PRACTICES AND STUDENTS' ATTITUDE TO BIOLOGY IN SENIOR
 SECONDARY SCHOOLS OF OYO STATE, NIGERIA.**

***Oluwatoyin Mary Oyinloye^{1,2} and Angela Temisan Ige².**

1. Department of Mathematics, Science and Technology Education, Faculty of Education, University of Zululand, KwaDlangezwa 3886, South Africa.
2. Science Unit, Department of Teachers Education, University of Ibadan, Ibadan 200002, Nigeria.

Manuscript Info

Manuscript History

Received: 19 March 2018
 Final Accepted: 21 April 2018
 Published: May 2018

Keywords:-

Teachers classroom practices, Students attitude, Academic performance, Predictor, Perception.

Abstract

This study investigated the perceptions of students on teachers' classroom practices and students' attitude as predictor of students' academic performance in biology in senior secondary schools in Oyo State. To guide the study, two research questions were raised. The study adopted an ex-post facto design. A sample of 400 students were used. Two validated instruments were used in the study titled: Students Perception of Biology Teacher and Biology Attitude Questionnaire with the use of simple frequency counts and percentage for analysis. From the data analysis it was revealed that: Students possess a slightly positive attitude towards biology and biology teachers have a slightly good level of classroom practices. However, it was concluded that teachers' classroom practices is not the only determinant 33on students' academic performance. Based on these findings, appropriate recommendations were made.

Copy Right, IJAR, 2018., All rights reserved.

Introduction:-

The decline in the performance of students in sciences in the recent years in the yearly senior school certificate (SSCE) especially in biology calls for concern among stakeholders of education. A lot of factors has been attributed to students' poor performance in biology one of which is the teachers' classroom practices. In any educational system, a teacher is the motivator and facilitator of learning. An important role of a teacher is to interpret and translate complex science concepts to the level appropriate to the learning experience of the target students.

Adeogun (2001), the quality of any educational system depends on the quality of its teaching staff which invariably are the teachers. Adodo (2007) stated that the main overriding factor for the success of students' academic achievement is the teacher, this emphasized the place and importance of teachers in an educational system. It is essential that teachers must first develop a personal understanding of the subject matter that they are expected to impart to their students. When teachers do not fully understand the content of science well they will not be able to teach it well (Abd-El-Khalick & Lederman, 2000) and even more damaging is the fact that they may cause students alternative conceptions.

Inevitably, how well science is taught will depend on the teachers understanding of the continuity and connections of concepts in science and their ability to relate these concepts to everyday life (Ball, 2000; Borko & Pytman, 1996). McNeil and Krajcik (2008) reported that the extent to which teachers use instructional practices such as modeling

Corresponding Author:- Oluwatoyin Mary Oyinloye.

Address:- Department of Mathematics, Science and Technology Education, Faculty of Education, University of Zululand, KwaDlangezwa 3886, South Africa.

scientific explanation making the rationale of scientific explanation explicit, defining scientific explanation, and connecting scientific explanation to everyday experiences will foster deep understanding of such concept to learners. It must be noted that Biology as a subject has philosophical orientation that stressed practical laboratory experiences that can be extended to the student immediate environment. Teachers' preparation for teaching the specialized science areas does not lay a great deal of emphasis on the skills that are especially relevant to the effective teaching of Biology. The principal goals of science education are to create men who are capable of doing new things not simply by repeating what other generations have done. Therefore, in the context of Nigeria objectives of science education, learners should be taught the skills and attitudes of science which are used to search for the scientific knowledge. This places the condition that those who are trusted with the duty of teaching students these skills and attitudes of science should themselves have the right skills and attitude of science.

Science would mean to students what their teacher knows about science or what he/she does. Teachers who are rich in substances but indifferent in methodology of science teaching or have received little or no instruction and guidance on teaching methods are likely to continue to do what was done to them by following familiar procedures (Sobonye, 2002). Hence, a situation where sciences in Nigeria secondary schools is taught by those who are deficient in the methodology of science teaching leaves a big question marks on the readiness of our school system to achieve set goals in science education and the sincerity and commitment of the government of the day in their promise to implement educational objectives and transform this into a technologically self-reliant nation.

Attitudes toward biology and learning in general are areas of interest to educators past and present. The term attitude (toward science) refers to a general and enduring positive or negative feeling about science (Koballa & Crawley, 1999). Extensive research has shown that a person's attitudes are learned, as opposed to being inherited. There are different factors which can influence student attitude, these includes the type of science courses taken, previous science experience, science teachers, as well as previous experiences and social influences (Morrell & Lederman, 1998). Attitude toward science can be defined as "favourable or unfavourable feelings about science subjects" (Morrell & Lederman, 1998). Recent research has shown that nearly fifty percent of students may lose interest in science by third grade (Weinburgh, 1998). Participation in science is also being affected, as the number of students preparing for a science-related career is on the decline (Chapman, 1997).

A student's attitude toward a particular discipline may affect his or her motivation to excel (Osborne et al, 2003). In order to facilitate learning. It is therefore important that educators familiarize themselves with student attitudes and associated behaviour (that is effort, reasoning and problem solving skills) as well as factors that may influence student attitudes. Student attitudes toward science have been investigated by number of researchers (Munby, 1981; Ramsden, 1998; Osborne et al. 2003, & Reid, 2006). Of all the variables that may influence attitude towards science, gender has generally been shown to have a consistent influence (Weinburgh, 1998).

Research on the differences in attitudes towards science in men and women has been frequently conducted and has produced valuable results, several studies has shown that men have better attitudes towards science than women, and that men are more apt to continue studying science (Weinburgh, 1998). In addition, females tend to be more adapted to school and learning, yet males continue to maintain better attitudes towards science and are more motivated to succeed in science (Simpson & Oliver, 1985). These results, showing that females can succeed in school yet still have lower attitudes toward science, support the continued under representation of women in sciences.

According to a study of bachelor degrees awarded between 1966 to 2001 in science and engineering fields; women hold nearly half of all the degrees awarded; however, the gap between the number of women receiving science and engineering degrees as opposed to other degrees has widened increasingly (National Science Foundation, 2004). William Rogers (1997) found out that there are many outstanding teachers in Nigeria schools who do an excellent job in teaching biology and other sciences, which should have a positive influence on their students. Unfortunately their efforts and accomplishments are not always recognized or rewarded, it is important that students leave their classes with a positive attitude towards biology.

The theoretical framework upon which this study was based is theory of discovery. This area of educational interest is a learning theory propounded by cognitive psychologists such as Brunner (1966) Gagne (1965) and Jane Piaget (1954). This learning theory maintained that learning is best promoted when one is able to figure things out for oneself. In other words He advocates a learning situation in which learners becomes "detective". The implication of Brunner's learning by discovery theory emphasized on discovery activity in which the students utilize his/her own

mental skills to find the answers. The focus is to develop skills that are practical in the teaching and learning of biology. This study was guided by the following research questions;

1. What are biology teacher's classroom practices in the teaching of science?
2. What are biology students attitude towards science?

HO1:-There is no significant relationship between teachers' classroom practices and student attitude towards biology.

The outcome of this study is envisaged to be of importance to the teaching and learning of science, especially to students, biology teachers in secondary schools, school administrators and curriculum planners.

Biology teachers in secondary schools stand to gain immensely from the findings of this research work, the findings of this study might serve as part of the contributed efforts made by educators in Nigeria to equip students to live effectively in the modern age of science and technology and to develop positive attitude towards learning of biology. Teachers should teach the necessary scientific skills and attitude that will enable student to manipulate their immediate environment for survival.

School administrators might see the need for laying emphasis on basic fundamental principles in learning biology. It might also serve as an integral part of curriculum innovation in education of Nigeria; it is hoped that curriculum planners should look towards teachers' practices as well as student possible attitude towards biology in the planning and development of science curriculum.

Methodology:-

The study was a descriptive research of the survey method. The population for this study was all teachers and senior secondary 11 (S.S. 2) students in South-West Nigeria. Simple random sampling technique was adopted to select twenty biology teachers and four hundred SS 11 biology students which form the population representation. Simple random technique was employed in drawing the participating schools after schools' comparability has been established using certain criteria such as: year of establishment, senior secondary certificate examination (SSCE) results, quantity and quality of laboratory equipment.

The research instruments that was employed to gather data in this study are; Biology attitude questionnaire (BAQ) and students' perception of biology teachers' questionnaire (SPBTQ). The researcher adapted the BAQ from the previous instrument developed and validated by Gaye and Julia (2007). The BAQ was divided into two sections; section A and B. Section A of the questionnaire sought for demographic information while the 25 items in section B were based on students' interest towards biology, future career in biology, importance of biology, and area of difficulty in biology. A reliability coefficient of 0.82 was obtained using Pearson product moment correlation statistics.

The students' perception of biology teachers' questionnaire (SPBTQ) scale was developed by the researcher in 2010. The SPBTQ was divided into two sections; section A and B. Section A of the questionnaire sought for demographic information while the twenty items were designed for students to rate their teachers classroom practices. These items were subjected to both face and content validity. The face validity was done by some lectures who are experts in test/evaluation in faculty of Education, they reviewed items for clarity, suitability of language to the target respondents. The trial testing of the instrument yielded a Cronbach alpha of 0.79.

Descriptive statistics was employed in the analysis of the data collected. All the research questions and hypothesis earlier stated were tested using Chi-square statistical tool while the hypothesis was tested at 0.05 level of significance.

Results:-

Research Question 1:

What are biology teacher's classroom practices in the teaching of science?

To answer research question 1, biology students were requested to rate their biology teachers on his/her classroom practices. Table 1 shows the mean as well as the standard deviation of students rating of their biology teachers. On the whole, the weighted average of 3.77 depicts a slightly good level of classroom practices by biology teachers. This finding provides the answer to research question 1.

Table 1:-Teachers' classroom practices

S/N	Teachers' classroom practices	Mean	Std Deviation
1.	Good knowledge of subject matter	4.29	1.05
2.	Introduction of new concepts to students	3.85	1.23
3.	Provide equal opportunity for learners in task	3.93	1.20
4.	Exposes learners to the joy of discovery	3.73	1.29
5.	Biology becomes compressible when carried out with practical	3.73	1.25
6.	Provide student with diverse opportunities	3.59	1.35
7.	Regular use of illustration during teaching	3.99	1.21
8.	Level of students teacher interaction during learning	3.76	1.31
9.	Level of students understanding during explanation of concepts	3.75	1.19
10.	Teachers ability to relate ideas from other subjects towards biology	3.81	1.21
11.	Observing	3.91	1.19
12.	Measuring	3.51	1.29
13.	Classifying	3.63	1.32
14.	Predicting	3.52	1.28
15.	Hypothesizing	3.65	1.30
16.	Curiosity about nature of science	3.81	3.81
17.	Accuracy in recording of data	3.69	1.26
18.	Creativity in handling instructional materials	3.75	1.22
19.	Honesty and open-mindedness towards results of experiment	3.80	1.28
20.	Strategy consistent with inquiry	3.62	1.23

Research Question 2:-

What are biology students attitude towards science?

To answer research question 2, biology students were requested to indicate their responses on their attitude towards biology. Table 2 shows the mean as well as the standard deviation of students' attitude towards biology. On the whole, the weighted average of 2.61 shows that generally these students possess a slightly positive attitude towards biology. This finding provides the answer to research question 2.

Table 2:-Student Attitude towards Biology

S/N	Students;' Attitude	Mean	Std Deviation
1.	I like biology more than other subjects	2.74	1.03
2.	Nature and biology is strange to me	2.08	1.03
3.	I would like to have biology lessons more often	2.81	0.99
4.	I hate biology lessons	1.79	0.97
5.	Task with living organisms in biology lesson is interesting	3.08	0.99
6.	I would like to make a career in this field	2.76	1.01
7.	Knowledge of biology is necessary for my future career	2.91	1.03
8.	My biology teacher is my role model	2.73	0.98
9.	My future career is independent of biology knowledge	2.46	1.08
10.	I would like to be a biologist	2.55	0.97
11.	Biology helps me to develop my conceptual skills	2.88	1.02
12.	Biology is not important in comparison with other courses	2.26	1.05
13.	Knowledge of biology is essential for other courses	2.73	1.01
14.	Knowledge of biology is not beneficial	1.92	1.06
15.	The study of biology improves the quality of our lives	2.93	1.03
16.	I like my biology teacher	3.02	0.96
17.	Our biology teacher makes us do active work	2.96	0.99
18.	My teacher disregards aspiration of student with bad rating	2.41	1.08
19.	I often have difficulties in understanding certain concept	2.35	1.03
20.	Biology is one of the easiest subject for me	2.60	0.98
21.	I like how biology is been taught in my school	2.97	1.00
22.	My biology teacher makes use of living organisms in practical class	2.89	1.03

23.	I never make use of any biolog equipment	2.32	1.15
24.	I am excited about biology lessons	2.75	0.96

Table 2 revealed students attitude towards biology with 8 out of the 24 items having poor (means which range from 1.79 to 2.46). These are item 4, 9, 12, 14, 18, 19, 20 and 24. The remaining 16 items obtained means scores of approximately 2.50 and above indicating good attitude to biology. The weighted average of 2.61 also shows that generally the students have a slightly positive attitude towards biology.

Hypothesis 1:-

HO1:-There is no significant relationship between teachers' classroom practices and student attitude towards biology.

Table 3:-Relationship between teachers' classroom practices and student attitude towards biology

Factors	Mean	Std. Deviation	N	R	Df	Sig	Remarks
TECHPRACTICE	75.3375	18.6821	20	.100	399	.045*	Significant
STDATTITUDE	65.4450	9.9983	400				

*significant at $p < .05$

From table 3 there is significant relationship between teachers' classroom practices and students' attitude in biology ($r = .100$; $df = 399$; $p < .05$). This relationship is positive but weak. Hence, as teachers' classroom practices improves students' attitude also improves therefore hypothesis 1 is rejected.

Discussion:-

Findings from this study showed that biology teachers had a slightly good level of classroom practices. This could be as result of series of seminars and workshop often organized by science teachers association of Nigerian (STAN) that enhance such performance. This finding is also consistent with prior research (Abd-El-khalck et al.1998; Duschl & Wright, 1989; Gess- Newsome & Lederman, 1993; Lederman, Gess-Newsome, & Latz, 1994) indicating that biology teachers possessed views consistent with those advocated by current reforms in science education, but who differed widely in terms of experience and teaching contexts. The study further revealed that teachers classroom practices and student attitude towards biology is positive and significant, it implies that as teachers' classroom practices improves, students' attitude also improves, this finding is in agreement with Brickhouse (1990), Duschl and Wright (1989). Previous researches concerning the relationship between teachers' conceptions of science and classroom practice have consistently alluded to the curriculum as a factor that significantly inhibits teachers' attention to the nature of science.

Generally, the students have a slightly positive attitude towards biology. The most pronounced reason for students' interest could be attributed to their background knowledge of integrated science, however they are interested in dealing with live animals and plants during biology lessons or practical classes. They found biology easier than other science subject such as physics and chemistry. This agrees with the finding of Prokop (2007), Tuncer (2007) and Chuda (2007) in which they stated that Slovak students have a positive attitude towards biology.

Conclusion and Recommendations:-

The study concluded that Biology teachers have a slightly good level of classroom practices; the study further concluded that students attitude towards biology is positive. Hence, as teachers' classroom practices improves, students' attitude also improves

This study has been able to shed more light on teachers' classroom practices and student attitude in biology, the word "slightly good" from teachers' classroom practices implies that remedial measures which will equip teachers to be more professional in their practices should be prioritized. In addition, the study has identified the need for capacity building programs which may include; seminars, workshops, conferences as well as symposia.

The following recommendations are considered relevant based on the findings of this study:

1. Government should make efforts to provide adequate or necessary training, re-training, seminars and workshops focusing on teachers' classroom practices.

2. Adequate provision should be made for science teachers particularly Biology to incorporate process skills in the classroom teaching, to enhance students positive attitude in Biology.
3. Both beginning and experienced teachers need to develop the instructional skills and abilities necessary to transform their knowledge into classroom practices.

References:-

1. Abd-El-Khalick, F, Bell, R.L., & Lederman, N.G. 1998. The nature of Science and instructional Practice: Making the Unnatural Natural Science Education, 82, 417-436.
2. Abd-El-Khalick, F. & Lederman, N.G. 2000. Improving Science Teacher's Conceptions of the nature of science: a critical review of the literature. *Int. J. Sci. Educ.* 22, 665-701.
3. Ajagun G.A. 2000. A Study of the Performance of Students in the Senior Secondary School Certificate Examination in selected Schools in Kano State. *Tambori: Kano J. Educ.* 6(1):10-21.
4. Ball, D.L. 2000. Bridging Practices: Intertwining Content and Pedagogy in Teaching and learning to teach. *Journal of Teacher Education*, 51 (3), 241-247.
5. Borko, H. & Putman, R. 1996. Learning to teach D. Berliner & R. Calfee (Eds), *Handbook of Educational Psychology* (pp. 673-725). New York: Macmillan.
6. Brickhouse, N.W. 1990. Teacher's beliefs about the nature of science and their relationship to classroom practice. *Journal of Teacher Education*, 41, 53-62.
7. Brunner, J.S. 1966. *Towards a Theory of instruction* Cambridge, Belknao Press.
8. Chapman, A. 1997. *A great balancing act: Equitable Education for girls and boys.* National Association of independent Schools; Washington, DC.
9. Duschi, R.A. & Wright, E. 1989. A case study of high school teachers' decision making models for planning and teaching science. *Journal of Research in Science Teaching.* 26, 467-501.
10. Gess-Newsome, J. & Lederman, N.G. 1993. Preserves biology teachers' knowledge structures as a function of professional teacher Education: *A year-long assessment-Science Education.* 77, 25-45.
11. Koballa, T.R. & Crawley F.E. 1985. The influence of Attitude on Science Teaching and Learning. *School Science and Mathematics.* 85 (3): 222-232.
12. Lederman, N.G., Gess-Newsome, J.G., & Latz, H.Z. 1994. The nature and development of pre-service science teachers' conceptions of subject matter and pedagogy. *Journal of Research in Science Teaching.* 31, 129-146.
13. McNeil, K.L. & Krajcik, J. 2008. Scientific Explanations Characterizing and evaluating the effect of teachers' instructional practices on student learning. *Journal of Research in Science Teaching.* 45 (1), 53-78.
14. Morreil, P.D. & Lederman, N.G. 1998. Students Attitude towards School Phenomena? *School Science and Mathematics.* 98(2): 76-83.
15. Munby, H. 1982. The impropriety of "Panel of Judges" validation in science attitude scales: A research comment. *Journal of Research in Science Teaching.* 19, 617-619.
16. National Science Foundation. 2004. *Women Minorities and Persons with Disabilities in Science and Engineering.*
17. Osborne J., Simon S. & Collins, S. 2003. Attitude towards science: A review of the literature and implications. *International Journal of Science Education.* 29(9), 1049-1079.
18. Reld, N. 2006. Thoughts on Attitude Measurement Research in Science and Technological Education 24: 3-27.
19. Simpson, R., & Oliver, S. 1985. Attitude towards Science and achievement motivation profiles of male and female students in grade six through ten. *Journal of Science Education.* 69 (4), 511-526.
20. Weinburgh, M. 1998. *Gender, Ethnicity, and Grade Level as Predictors of Middle School Students' Attitudes towards Science.* Georgia State University.
21. William D.R. 1997. *Factors that affect student attitude towards Biology.* Department of Biology, Ball State University, Muncle.