

RELATIONSHIP AMONG STUDENT'S MOTIVATION, BIOLOGY PRACTICAL SKILLS AND ACADEMIC ACHIEVEMENT IN SENIOR SECONDARY SCHOOL IN MUNICIPAL ZONE, KANO, NIGERIA

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Abstract

This study investigated the Relationship between Student's Motivation, Biology Practical Skills and Academic Achievement in Senior Secondary School in Kano Municipal Zonal education, Kano State, Nigeria. The study is correlation design. Three objectives, three research questions were stated with three null hypotheses to guide the study, which were tested at 0.05 level of significance. The population of the study consists of all second year senior secondary School Students offering Biology in Kano municipal zonal education. Six (6) Schools were selected by purposive sampling technique totaling of (1,307), males Students are (641) and (666) are female Students. The instrument used for data collection in the study was direct assessment of Biology practical skills (DABPS), Student's Motivation test (SMT), and Biology achievement test (BAT). Split half reliability method was used to ascertain the reliability of the instrument, and the reliability coefficient (r) of 0.79 was obtained. The data collated were analyzed using descriptive statistics (Mean and standard deviation) to answer all the research questions and inferential statistics ANOVA, to test hypotheses one, two, and three, the findings of the study showed that there is significance difference in the level of academic achievement in Biology among senior secondary Schools Students based on Schools. Another finding showed that there is significant relationship between Motivation in Biology practical skills and academic achievement in Biology among secondary Schools Students in Kano municipal zonal education.

Keywords: Relationship, Biology, Practical skills, Motivation, Academic achievement.

INTRODUCTION

Science is a systematic, precise and objective way to the study of natural world (Nwagbo, 2005). The introduction of science as a subject in School curriculum was done with the view to develop scientific attitude, critical thinking, active inquiring, and independent work so as to understand the physical world from different perspectives (Yada & Mishra, 2013). The field of science education comprises science content some social science and some teaching pedagogy (Berube, 2008). Aina (2013) define Science Education as the study of science subjects such as Biology, Chemistry and Physics with teaching method in order to impart scientific knowledge to individual or community.

Biology education deals with teaching of Biological concepts and addressing the learners' misconceptions. The role of Biology education is very important in lives and in general in the advancement of science technology or the development of mankind and the society in at large (Olodipe & Awokoy, 2010). To understand Biology fully, it is necessary for the Students to undergo different practical on Biology to acquire the skills in Biology practical.

Biology practical is a connection with real situation rather than with idea or theories, it is performed by hand or with human intervention using equipment, tools or technology requiring guidance or movement (Nuffield Foundation Royal Society of Biology, 2008). Practical skills primarily require physical detector although an understanding of principles, processes, and sequences is also essential especially for more complex practical skills. It is also an essential part of science education. It gives Students the necessary skills for higher education and employment to deepen their knowledge of scientific ideas and enables them to engage in the processes of science (Wallace, 2014). Joyce, Weil and Calhoun (2014), stated that the term 'practical skills' to refer to "any teaching and learning activity which at some point involves the Students in observing or manipulating the objects and materials they are studying'. Joyce et al (2014) preferred the term 'practical skills' rather than 'laboratory skills' "because location is not a critical feature in characterizing this kind of activity. When the practical is conducted regularly in the School it makes the Students to be motivated and interested to the subject taught, that is Biology and Biology practical.

Motivation is defined as the impetus behind a person's actions: it affects why people act in certain ways, leading to the goals that they implemented for themselves (Ryan & Deci, 2000). It is the driving force behind the energy required to complete a task. Lack of Motivation can give rise to lack of driving power behind completing a certain task. Motivation is what pushes us to achieve our goals, feel more fulfilled and improve overall quality of life. It is the reasoning behind an individual's actions. Students with higher need for achievement have greater academic performance. As such, Poor Students' Motivation can affect their academic achievement in the Schools.

Achievement is the competence to perform efficiently and respond quickly to a given task (Bell, 2013). It is the act of getting things done as we desired or getting things that we expected. Adeyemi (2008) stated that, Achievement is the scholastic standing of a Student at a given moment and it has to do with the successful accomplishment of goals. Academic achievement represents performance outcomes that indicate the extent to which a person has accomplished specific goals that were the focus of activities in instructional environments, specifically in School, college, and university. It is the extent to which Students, teachers or institution has acquired their short or long- term educational goal. Academic achievement is a result of academic instruction and learning, accomplishment of an aim; it reflects the extent to which Student have attained their educational stated objectives cognitive attainment in any core and optional subject at secondary School level (Akagh, 2013)

There are several related studies to the influence of biology practical skills on academic achievement of students Nwagbo & Uzoamaka (2011) carried out a study titled: Effects of Biology Practical Activities on Students' Process Skill Acquisition in Abuja municipal area council, Nigeria. The study investigate the Effects of Biology Practical Activities on Students' Process Skill Acquisition in abuja municipal area council. The design of the study was quasis-experimental, specifically the pre-test, post-test, Non equivalent control group design. The population of 17 co-educational secondary Schools in Abuja Municipal area council. The Sample of 111 Senior Secondary one (SS1) Biology Students randomly drawn from two coeducational Schools were used for the study, three research questions and three null hypotheses guided the study. The instrument used for data collection was Science Process Skill Acquisition Test (SPSAT). The validation of SPSAT was done by two specialists in Science Education Department, University of Nigeria, Nsukka, and University of Abuja who are experienced science teachers. Split-half reliability technique was used to estimate the reliability of SPSAT. The data collected from the pre-test and post-test of SPSAT were analyzed using Mean and standard deviation for answering the research questions and analysis of covariance (ANCOVA) for testing the hypotheses at 0.05 % level of confidence. The findings revealed that there was no

interaction between teaching methods and gender of the subjects to influence Students' acquisition of science process skills. In the case of gender, the findings of this study revealed that male Students has a higher Mean score than their female counter parts in SPSAT although the difference was not significant. In the study conducted in Abuja municipal area, emphasis was put on Effects of Biology Practical Activities on Students' Process Skill Acquisition only. The study investigated the Effects of Biology Practical Activities on Students' Process Skill Acquisition but does not include Students' Motivation and their academic Achievement. The two studies share variable of Biology Practical Skills and it is conducted in different locations of Abuja Municipal Area and Kano Municipal Education Zone, Nigeria. There is need for the reseachers to conduct the same research on the Relationship among Students' Motivation, Biology Practical Skills and Academic Achievement in Senior Secondary School in another Area.

Research Objectives

Specifically, the study intended to determine:

1. The level of Motivation in Biology Practical Skills among Secondary Schools Students of Kano Municipal (KMC) Zonal Education, Kano State based on Schools.
2. The level of Biology Practical Skills Performance among Secondary Schools Students of KMC Zonal Education, Kano State based on Schools.

Research Questions

The following research questions were formulated:

1. What is the level of Motivation in Biology Practical Skills among Secondary Schools Students of Kano Municipal (KMC) Zonal Education, Kano State based on Schools?
2. What is the level of Biology Practical Skills Performance among Secondary Schools Students of KMC Zonal Education, Kano State based on Schools?

Materials and method

The research design that was adopted for this study was correlation research design.

Correlation Design

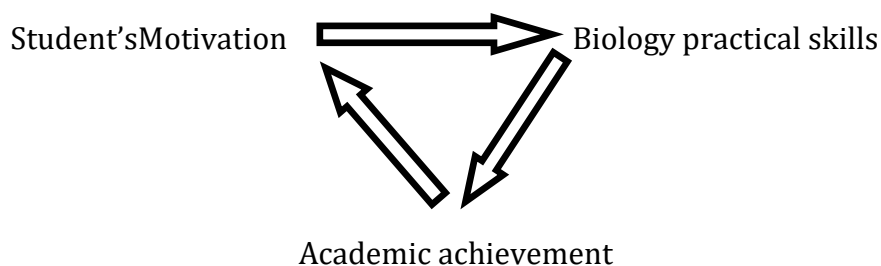


Figure 1: Research design illustration.

Motivation is very vital in any field of study; motivation it makes the students to work hard at the end to achieve his desired goals. When there is motivation in a certain subject like Biology and Biology Practical make the students to undergo different courses and practical conducted in the laboratory at the end it will improve his/her Academic Achievement. But when there is either overload theory or regularly practical and report, no time to rest. The subject (Biology) become boring to the students or students' loose interest on it, this will lead to affect their Academic Achievement.

The population of the study consisted of all second year senior secondary School Students II (SS2) offering Biology in Kano Municipal Zone. There are 33 government senior secondary Schools that offering biology in the zone. The School population consisted of boys and girls. The population of the Students in the School was seven thousand one hundred and fifty three Students (7153). SS II Biology Students were chosen in this study because most of the practical contents were in that level, ac-

cording to Biology curriculum for senior secondary Schools of Federal Republic of Nigeria (FRN, 2013); Kano Educational Resource Department (KERD, 2019).

The sample for each School was drawn using Research Advisor. Based on this population, a sample size of 365 was used. The selected Schools and their samples were represented in table 1

Coding: - The Names of the Schools were replaced with codes for ethical reasons. The codes used are 001, 002, 003, 004, 005 & 006 for GGSS Hassana sufi, GGSS Hausawa model, GGSS Gandun Albasa, GSS Sharada, GASS Kundila and GSS Hausawa Respectively.

Table 1. Sample size

S/N	School code	Gender	Sample
1	001	Female	52
2	002	Female	39
3	003	Female	96
4	004	Male	85
5	005	Male	35
6	006	Male	58
Total			365

Source: - According to Research Advisor

To distribute the sample size to selected Schools:

$\frac{\text{Number of selected Schools}}{\text{Total number Students}} \times 365$

In this study, simple random sampling technique was used to draw the sample of the research. The type of random sampling technique known as Paper balloting without replacement was used, in which each name of the School was written in a small piece of paper. The researcher picked a piece of paper from the box and records the names of the Schools in a separate sheet until the number of the required samples was drawn. Six (6) Schools were selected from the Schools in Kano municipal zone from the study population. Three Schools are male Schools and other three are female sSchools.

The sampled Schools were used in the study to represent the entire population of the Schools under study. Random sampling technique was used because it minimizes bias, and each member of the population has equal chance of been selected.

Three instruments were used in this study for data collections, which were; Direct Assessment of Biology Practical Skills (DABPS), Student's Motivation Test (SMT) and Biology Achievement Test (BAT).

Validity of the Instrument

The instrument on Direct Assessment of Biology Practical Skills (DABPS), Student's Motivation Test (SMT), and Biology Achievement Test (BAT) were submitted to three (3) experts from faculty of education Bayero University Kano. One of the three experts was a professor specialized in educational technology, science education and the other two were senior lecturers specialized in science and technology education.

Reliability of the Instrument

The reliability of this research instruments was determined by pilot testing. The questionnaire was administered to thirty (30) sample subjects outside the study area with the similar characteristics to test the reliability of the instrument, To do that, a split half reliability was used.

The instrument for the collection of data was taken to the sample Schools and distributed to the Students, before the administration of the questionnaire, a necessary step was followed and appropriate precaution was taken for each School. After being satisfied with the arrangement, the researcher with the help of the Biology teacher in the School distributed the instrument to the Students, they also inform them that, their academic carrier will not be affected as it would only be for research purpose and their response would be kept strictly confidential. Hence they should be free and frank, honest and sincere in attempting the questions. In order to free them from boredom, they were given one hour thirty minutes to answer the questions. Then latter the instrument was collected back for onward analysis and interpretation of the result.

The data generated was analyzed using SPSS to run Descriptive and Inferential Statistical tools. The research questions were answered using descriptive statistics specifically mean and standard deviation. The Mean and standard deviation answered all the research questions of the study.

Decision rule

The weight option of the instruments were 4, 3, 2, and 1 for strongly agree (SA), Agree (A), Disagree (DA), and strongly dis agree (SD) respectively. Therefore, the decision rule is that, any School with Mean score of 2.5 has moderate level of motivation, and moderate performance in practical skills. Schools with Mean score above or higher than 2.5 has high level of motivation and high performance in practical skills. While Schools with Mean score of less than 2.5 is considered to have low level of motivation and low level of performance in practical skills respectively.

For Biology Achievement Test (BAT), scores of 60-100 is assigned High achievement, 50-59 is Moderate achievement and scores of 40-49 is low achievement.

Result and discussion

The data collected from the field to assess the Relationship among Students' Motivation, Biology Practical Skills and Academic Achievement in Senior Secondary School Students of Kano Municipal Education Zone, Kano were analyzed and presented below.

Research Question One: What is the level of Motivation in Biology among Secondary Schools Students of KMC Zonal Education, Kano State based on Schools?

Table 2: Level of Motivation in Biology Practical Skills among SSS of KMC Based on Schools:

S/NO	Schools	N	MEAN	SD	Decisions
1	A	52	2.6539	.35548	High Level Motivation
2	B	39	2.5624	.40833	Moderate Level Motivation
3	C	96	2.6945	.45624	High Level Motivation
4	D	85	2.5482	.29821	Moderate Level Motivation
5	E	35	2.4971	.55738	Low Level Motivation
6	F	58	2.4977	.38373	Low Level Motivation
Mean Average			2.5903	.41009	

Source: Field Work, 2021

Table 2 shows that, the level of Motivation in Biology Practical Skills among Secondary Schools Students of KMC Zonal Education, Kano State based on Schools presents that, the higher mean score of 2.6945 with standard deviation of 0.45624 were recorded. Therefore, the analysis show that there is high level of Motivation in Biology Practical Skills among Secondary Schools Students of KMC Zonal Education, Kano State based on Schools because is higher than the decision rule of 2.50.

Research Question Two: What is the level of Biology Practical Skills among Secondary Schools Students of KMC Zonal Education, Kano State Based on Schools?

Table 3: Level of Biology Practical Skills Performance among SSS of KMC Based on Schools:

S/NO	Schools	N	MEAN	SD	Decisions
1	A	52	2.7269	.26904	High Level Practical Skills
2	B	39	2.6633	.34402	High Level Practical Skills
3	C	96	2.5821	.33318	Mod. Level Practical Skills
4	D	85	2.6243	.27213	High Level Practical Skills
5	E	35	2.6762	.38062	High Level Practical Skills
6	F	58	2.6517	.41437	High Level Practical Skills
Mean Average		365	2.6413	.33347	

Source: Field Work, 2021

Table 3 shows level of Biology Practical Skills performance among Secondary Schools Students of KMC Zonal Education, Kano State based on Schools presents that, the higher mean score of 2.7269 with standard deviation of 0.26904 were recorded. There by the analysis show that there is high level of Biology Practical Skills performance among Secondary Schools Students of KMC Zonal Education, Kano State based on Schools.

Discussion

The study was conducted to investigate the Relationship among Students' Motivation, Biology Practical Skills and Academic Achievement in Senior Secondary School in Municipal Zone, Kano, Nigeria. The researcher used questionnaire as the instrument of data collection in the study. Two research questions were answered and tested respectively, and the results obtained were discussed in the following paragraphs:

The result from research question one presented in Table 2 indicated that the level of Motivation in Biology Practical Skills among Secondary Schools Students of Kano Municipal Zonal Education, Kano State based on Schools is high.

Second finding of the study indicated that, the level of Biology Practical Skills performance among Secondary Schools Students of KMC Zonal Education, Kano State based on Schools is high, and there is significant relationship on the level of Biology Practical Skills Performance among Secondary Schools Students of KMC Zonal Education, Kano State based on Schools. These findings present that, the total Mean of Schools is higher than Mean average of 2.64 was recorded and this shows that, the level of Biology Practical Skills Performance among Secondary Schools Students of Kano Municipal Zonal Education, Kano State is high.

Conclusion

Motivation, practical skills is of paramount importance in teaching and learning processes. This study investigated the Relationship among Students' Motivation, Biology Practical Skills and Academic Achievement in Senior Secondary School in Municipal Zone, Kano, Nigeria. The following conclusions were made from the study:

1. The level of Motivation in Biology Practical Skills among Secondary Schools Students of Kano Municipal Zonal Education, Kano State based on Schools is high.
2. The level of Biology Practical Skills performance among Secondary Schools Students of KMC Zonal Education, Kano State based on Schools is high.

Recommendations

The following Recommendations were made from the study:

- 1 The teachers and authority concern should encourage the students to develop interest and understand that motivation and practical skills have strong relationship with academic achievement.
- 2 The level of Biology Practical Skills performance among Secondary Schools Students of KMC Zonal Education, Kano State based on Schools were high, therefore, the teachers should ensure that the standard is maintained.
- 3 The level of academic achievements in Biology among Secondary Schools of Kano Municipal Zonal Education, Kano State based on Schools is high, therefore, the teachers should ensure that the standard is kept up.

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