Effects of Biology Practicals on Academic Performance of Secondary School Students in Biology in Ikere Local Government Area of Ekiti State, Nigeria

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Received: September 15, 2020 Accepted: October 20, 2020

ABSTRACT: *The study examined the effects of Biology practical work on academic performance of secondary school students in Ikere Local Government Area of Ekiti State, Nigeria. The sample for the study comprised of one hundred and twenty five (125) students drawn from the population of study using simple sampling techniques. The instruments for data collection in this study was questionnaire and were analyzed using mean and standard deviation. The results revealed that students understand better when they involve themselves in practical experiment, thus matching theory with practical. Biology practical activities, stimulate creating, curiosity and critical thinking, there is no clear different between female and male on academic achievement in biology. It is recommended that teachers should endeavor to organize practical work for students as frequently as possible (at least once a week) so as to develop in the students the practical skills required of them for final examination. Also students should be advised to take every biology practical work very seriously. Finally, laboratory technicians should be employed by school authorities to assist biology teacher(s) in the area of practical work so that workload, time management and frequent practical are realistic to enhance students' achievement.*

Key Words: *Biology, Practical, academic performance, secondary school.*

Introduction

Science is a great enterprise which nations depend on, in-order to advance technologically. Science therefore, is receiving much emphasis in education because of its significance and relevance to life and society. Biology as a branch of science and the prerequisite subject for many fields of learning contributes immensely to the technological growth of the nation. This includes medicine, forestry, agriculture, biotechnology and nursing. The study of Biology in senior secondary school can equip students with useful concepts, principles and theories that will enable them face the challenges before and after graduation.

Practical activities in biology provide opportunities for students to actually do science as opposed to learning about science. Nzewi (2010) asserted that practical activities can be regarded as a strategy that could be adopted to make the task of a teacher (teaching) more real to the students as opposed to abstract or theoretical presentation of facts, principles and concepts of subject matters. Nzewi maintained that practical activities should engage the students in hands-on, mind-on activities, using varieties of instructional materials/equipment to drive the lesson home. Nwagbo (2010) stated that the use of practical (approach) to the teaching of biological concepts should therefore be a rule rather than an option to biology teachers, if we hope to produce students that would be able to acquire the necessary knowledge, skills and competence needed to meet the scientific and technological demands of the nation.

Biology is one of the science subjects offered at secondary school level in Nigeria which attracts the greatest patronage of both science-oriented and arts-based students except where health science is offered. This status is enhanced by the national policy on education stipulation (FME, 2014). Biology as a science course involves the use of process skills and different approaches to bring about meaningful learning in the learners. However, there appears to be a continuous annual poor academic performance of students in public examinations (Okebukola, 2016).

Alarming reports still continue to come from examination body such as West African Examination Council (WAEC, 2014) concerning poor performance in the sciences despite various educational improvement efforts of government such as financing and provision of instructional materials to popularize science in the secondary schools (WAEC, 2009, 2010, 2011, 2012, 2013 , 2014. 2015 & 2016).

Practical work stimulate learners interest in the science subjects they are studying, when they are made to personally engage in useful activities, knowledge obtained through practical work and experience promote long-term memory that theory alone cannot do, for this reason, it becomes obvious that learners acquire more in any science lesson, if giving the opportunity to do activities and ranging from manipulating apparatus, classifying, designing, experimenting, hypothesizing to make inferences and verifying result. Hence, there is an urgent and serious need to justify the exposition of the biology practical activities as well as studying its influence on students' performance in biology. Unfortunately, the ugly situation observed in the majority of our secondary school lacks exposure of student in practical activities. This contributes to persistent poor performance in biology.

A number of research findings from Akubuilo (2014), Akpan (2018) and Ajaja (2011) showed that several factors are responsible for the poor performance of students in practical biology and other science subjects such as adhering to instructions, crossing of guidelines in drawings, labeling, handling of equipments like pipettes, burettes for carrying out certain measurements. Among these factors as observed by other researchers are students' poor understanding of the basic concepts in biology (Chukwuneke, 2012), the use of traditional lecture method approach by science teachers (Ndioho, 2010), students' poor attitude towards practical work and their performance in science (Orokpo, 2010). It has also been found that girls are more prone than boys to exhibiting fret and anxiety on science related tasks (Ndioho, 2010). Poor performance of students in biology is as a result of poor state in which biology and science in general are taught in the secondary school. "Chalk and Talk" method has been the most widely used science teaching method (Hills, 2012).

Even more seriously is the discovery that practical skills in biology in the Nigerian secondary schools are hardly measured at all by biology teachers (Adedeji, 2010; Ajaja, 2011). The target is always the end result rather than exposing the students to tasks to see them display their practical skills (Njelita, 2010). In school, practical activities could be carried out in many ways. For the purpose of this study three groups were involved. The control group did not receive any practical lesson after the teaching. However, the intermediate group refers to the group of biology students who were taught the theory aspect for six weeks and within this duration only two practical sessions were conducted. Finally in the harmonized group all lessons were accompanied with practical or experiments for the duration of six weeks of teaching.

Many studies have shown that learners of science in Nigeria perform poorly at all levels of education (Orokpo, 2010; Achor & Ogbeba, 2012). It has also been found that girls perform in similar manner as boys in biology when cooperative strategy is used for teaching (Achor, Musa & Duguryil, 2013). Unfortunately, gender inequality in education has remained a perennial problem of global scope (UNESCO, 2013; Reid, 2003; Achor, Musa & Duguryil, 2013). Science researchers have reported that what both the 'feminist empiricist' and the liberal feminist critics' seem to agree on is that females, in principle, will produce exactly the same scientific knowledge as males provided that sufficient rigour is undertaken in scientific enquiry (Sinnes, 2010; Ajaja, 2011). They all believe that initiatives that build on the assumption that females and males are equal in their approach to science, and the inequality in science and science education is caused by political, educational and social factors external to science. In this study, students were grouped into three which were the control, the intermediate and the harmonized groups to examine how the treatment (that is, effect of practical) facilitated Performance in biology.

Biology practical are defined as the learning experiences in which students interact with materials or with secondary source of data to observe and understand the natural world (Lunetta, 2017). Practical biology is viewed as any science teaching and learning activity which involves students, working individually or in small groups, manipulating and observing real objects and materials, as opposed to the virtual world (Science Community Representing Education [SCORE], 2010).

Biology practical are the scientific instruction, which brings about learning activities in science. There are student-centred methods of doing school work, but laboratory work is the flagship for learning in science and extension of biology (Singer, 2015;Lowman & Harderoad, 2018;Gidding,2016;Woolnough, 2013).

According to The Macmillan Dictionary (2018), Biology practical are defined as an examination or lesson in which a students' makes things or does experiments. The term refers to what appertains to practice or action "doing". The "doing" depends on acquisition of the required skills. The terms practical and skills go hand in hand for effective learning of biology, as spelt out in the biology syllabus. Practical skills are tested exclusively in the practical paper. However, findings of practical may be tested in a theory paper. The level of competence in practical skills may determine performances in a class and ultimately at the national level. Hodson (2012) observed that going through the materials needed for a practical, for example, those required for testing for types of food and doing the stipulated practical using the provided materials, is

expected of a students. Roberts (2010) reported from research findings that, "doing" has been found to be the easiest skill attainable by students' respondents; many professed to like the "doing" aspect of science practical learning skills but the liking may not translate into performance in schools. Roberts (2010) also conducted a study and noted that practical nature of science results in solving problems scientifically

Practical classes in animal diversity, ecology and behaviour offer students opportunities to handle preserved specimens of animals and to see the external and internal structures of animals first- hand. The practical exercises allow students to review the lecture content and to fully understand the functions of the various structures. Students are arranged on benches in small groups. This gives them the opportunity to discuss concepts together. The teachers are available to identify structures and to interpret what they see in terms of their functions. All these benefits are lost if biology lessons follow literary approaches. Although there is some concern about the lack of biology practical activities in the senior high schools (Okoampa, 2010), no study has been conducted to investigate the issue in the study area.

Biology is one of the fields in the natural sciences that studies living things. The word 'Biology' is come from Greek words; Bios meaning life, and logy (logia) which means study (Ezemoka, 2011). Thus the concept of biology is concerned with the study of life. Miller and Levine (2012) state that biology in addition, is the study of life, structure, function, growth, origin, evolutions distributions, interrelationships, problems such as diseases, and adaptation of things and proposes solutions where possible. However biology is the branch of science that studies life using inquiry methods and discoveries.

Inquiry process involves asking question that stimulate students to think critically which enables students to develop scientific knowledge and scientific habit such as curiosity, creativity, and open minded etc that is needed for understanding biological concepts. Biology as science of life provide potentials for the use of many inquiry method. Abugu (2017) stated that biology is natural science in which we study living organisms plants and animals. The knowledge of biology helps in checking environmental degradation such as desertification, erosion, water hyacinth, land, air and water pollution.

The cardinal objectives of biology education are to prepare students to acquire: adequate laboratory and field skills in biology; meaningful and relevant knowledge in biology, ability to apply scientific knowledge to everyday life in matter of personal and community health and agriculture and lastly reasonable and functional scientific attitudes (Federal Ministry of Education 2014). The study of biology in senior secondary school can equip students with useful concept principles and theories that will enable them face the challenges before and after graduation. Practical biology is the scientific study of the life and structure of plant and animals and their relative environment in real or experimental set-up rather than dwelling in the theory and ideas (Opuh, Eze, & Eze Magu, 2018).

Biology practical teachings are important in order to understand biology concepts. If science education aims to enhance the understanding of the natural world by students and how it functions, then the students have to experience and observe the relevant of science phenomena. Recent studies advocate for a change in teaching methods so that students participate fully and understand different science concepts (Miller, 2010). Students should understand processes and structure; develop skills in manipulation, processing of science information and conducting scientific investigations. Hence, the teaching methods such as learners design, reciprocal, inclusion, divergent and self-check could enhance the teaching of Biology practical lessons (Capel, Least & Turner 2019).

A study conducted by Obiekwe and Chinwe (2015) in Nigeria on the teaching of biological concepts using the 5E (Engagement, Exploration, Explanation, Elaboration and Evaluation) model revealed that students who were exposed to the 5E method achieve better results than those whose teachers use the lecture method. Some teachers laid too much emphasis on content and the use of "chalk and talk approach which does not enhance the teaching and learning of biology. This slackness and shy-away attitude from activity based-approach of instructional delivery has led to abstraction, which makes the students passive and more inclined to role memorization (Obiekwe & Chinwe, 2012). Such teacher-centered method that put the students as passive recipients of knowledge and the teachers as the only source of knowledge might not improved performance towards biology practical lessons (Nwagbo 2016).

Gender has been described as a cultural construct and social positions which members of the society attach to being male or female. Gender also means a dimension of social organization which shapes how people interact with others and how people behave or act and think about themselves. It also includes hierarchy and ranking of men and women distinctly in terms of power, wealth, privilege and other resources. According to Okeke (2019) gender is a social or cultural determinant that varies from place to place or culture to culture. It is not universal, unlike sex which is biologically determined and universal. Macionis and Genber (2015) observed that throughout life (birth and death), human feelings, thought and actions reflect the social definitions that people attach to gender which affects the way the individual's daily

activities may either be positively or negatively influenced. As gender affects the way people think of themselves, it teaches them to act in normative ways, that is acting and feeling in the manner that the society ascribed to each sex. Connell (2013) maintained that as much as culture defines males as ambitious and competitive and females' differential and emotional, males are expected to aspire to leadership positions while females are expected to be good listeners and supportive observers. This gender role discrimination begin from the family and is later extended to other areas of one's life where a man sees himself as superior in every human endeavours and sees woman in a subordinate position in the educational setting, workplace or other parts of life. In other words gender is a fundamental category for ranking, and classifying social relations in the world (Evans, 2014).

In educational setting for instance, experience has shown that the curriculum, textbooks and the teaching materials tend to favour males and the females' intellectual potentials are ignored. This gender distinction manifests itself in the courses offered by males and females in the school, for example males are represented in mathematics, science and technology while females are grouped into humanities, education and social science courses (Gaidzanwa, 2010; Cottes, 2013). In the new areas of study such as computer science with its grounding in engineering, logic and mathematics, males mostly enroll in it while female mostly enroll in gender studies (Macionis & Genber, 2015). The word gender does not mean that there are clear difference between female and male in term of preferences for arts, science and technology. If there are differences, they are based on hierarchical structures within the culture of what is suitable for males and females respectively (Walkerdine, 2019). According to Kembler (2010) science and information and communication technology (ICT) is in no manner separated from the cultural structures that treat women and girls unfairly or unequally compared to the men counterparts. Males and females are supposed to be allowed and encouraged to study science and technology, Arts, and humanities because there is no course that is made specifically for each sex. Science and technology courses are not for males alone; females are to be encouraged and motivated to offer science and technology because of its importance in this era of globalization and computer age Nwosu (2011). Recently gender related issues in science education have continued to receive serious attention judging by the number of studies done to that effect. For example Babajide (2010) reported that science subjects such as physics and chemistry are given masculine outlook by educational practitioners. In addition to this, the studies by Ogunleye (2012).

Okwo and Otubar (2010) indicated that science performance depends on gender. Also the studies by Nzewi (2010); Ogunleye and Babajide (2011); posited that gender is insignificant in science performance. Oludipe (2012) also opined that promoting performance in students' understanding of science does not depend on gender rather it is through determination of the students. Agomuoh (2010); Ukozor (2011) found that gender influences students' conceptual shift in favour of the male.

Harlen (2012) attributed gender inequality in science teaching methods used by science teachers that creates wider gap in performance. This statement has been supported by Agomouh (2010). Studies by Madu (2014); Agomouh (2010) have shown that students performance are gender dependent using constructivist based instructional method. Considering the findings of different people above, it is clear that there is not yet a consensus as to whether gender influences science performance or not. Some are of the opinion that males are superior to females, while others said is females and some are even neutral.

Experience is the best teacher. Seweje & Jegede (2005) noted that the ability of a teacher to teach is not derived only from one's academic background but it is based up on outstanding pedagogical skill acquired. Stronge, Ward, Tucker and Hindman (2007) and Kosgei, Mise, Odera & Ayugi (2013) all asserted that there is positive correlation between teachers experience and students'academic achievement. However, Murnane (2016) found that teachers effectiveness improves rapidly in the over the first three years of teaching and reaches its highest point between the third and fifth year but found no substantial improvement after five years.

According to Edu & Kalu (2012) academically qualified teachers are those who have academic training as a result of enrolment into educational institution and obtained qualifications such as OND, NCE, HND, B.Sc, BA, B.Ed., M. Sc, MA and others while professionally qualified teachers are those who have professional training that gave them professional knowledge, skills, techniques aptitudes as different from the general education. However, Darling-Hammond (1998) defines a well-qualified teachers as one who was fully certified and held the equivalent of a major in the field being taught. Impact of teacher's qualification on student's achievement in education. For instance, Harris and Sass, 2008 reported that the most important school-based determining factor of students achievement is the teacher quality. Akisolu (2010) asserted that availability of qualify teachers determined the performance of students in schools. On the contrary, Igwe (2010) investigated the influence of teachers qualification in Kano and reported that there is no significant relationship between teachers qualification and student's performance. Huang and Moon

(2009) states that teachers qualification accounted for approximately 40 to 60 per cent of variance in the average of student's achievement in assessment.

Teachers' experience and educational qualifications were the prime predictors of teachers' job commitment and students' academic achievement. However, Ravkin (2015) found that teachers' teaching experience and educational qualifications were not significantly related to teachers' job commitment and students' achievement. Etsy's (2015) study in Nigeria showed that teachers factors that significantly affected job commitment and immensely contributed to low academic achievement were incidences of lateness to school, incidences of absenteeism, and inability to complete the syllabi. Oredein and Olayede (2017) concluded that teachers management of homework and assignments given to students have an impact on students' achievement especially when it is well explained, motivational, corrected and reviewed during class time and used as an occasion for feedback to students. However, the researcher intends to review and examine the following demographic variables, teachers' age, gender, educational qualification, years of experience and other variables to ascertain teachers' commitment to teaching profession and how these variables influence.

Teachers experience has a significant effect on students academic performance as experienced teachers have a richer background of experience to draw from and can contribute insight and ideas to the course of teaching and learning, are open to correction and are less dictatorial in classroom.

A teachers years of experience are one of the teachers qualifications indicators that is believed to be a significant determinant of students academic performance. Boyd, Landford, Loeb, Rockoff, & Wyckoff, (2018) believed that greater teaching experience will produce students with higher achievement. Studies have shown that inexperienced teachers are typically less efficient than the experienced teachers Darling-Hammond, (2010). Studies have found a positive relationship between teachers' effectiveness and their years of experience and efficient teachers positively influence students' academic achievement Agharuwhe, (2013). However, there is the need for caution in Nigeria about the experience. Many teachers may have been in the teaching profession for over twenty years without properly developed himself or herself for years. This category of teachers may not be able to cope with the new trends in education. The subject curriculum is changing almost every year as the whole world is changing with technology. Therefore, it is better to say there is a positive relationship between experience and students achievement when there is adequate teachers professional and academic development.

Studies on the effect of teachers experience on students learning have found a positive relationship between teachers effectiveness and their years of experience, but not always a significant or an entirely linear one (Murnane & Philips, 2011). Similarly, Wanderi (2015) pointed that there are conflicting findings. Some studies suggested that teachers with more experiences how less positive attitudes towards inclusion, while others found that teachers' experience with pupils with special education needs increased so did their confidence. Years' of teachers experience is found to be a significant contributing factor towards teachers' attitudes regarding inclusion.

Chikelu (2017) conducted a research on effect of biology practical activities on students process skill acquisition. A quasi experimental design was employed for the study. The sample consists of one hundred and eleven (111) senior secondary one biology students selected through simple random sampling techniques. The instrument for data collection in the study has 20 items Science Process Skill Acquisition Test (SPSAT). The data was analyzed using mean and standard deviation to answer the research questions and analysis of covariance (ANCOVA) to test the hypothesis at 0.05 level of significance. The results revealed that practical activity method to foster the acquisition of science process skills than the lecture method. The interaction effect between teaching methods and gender of the subjects was not significant.

Based on the findings of this study, the use of practical activity method to foster the acquisition of science process skills in biology students was recommended to biology teachers.

The similarity between the reviewed study and the present study is that the studies are both conducted in the laboratory. They used the same experimental research design. Both studies used gender as their moderating variable. The differences between the two studies is that the present study is investigating the influence of biology practical activities on students achievement in biology.

Cengiz (2010) carried out study on the effect of the virtual laboratory on students achievement and attitudes in chemistry. The study employed a quasi-experimental research design, specifically the pre-test and post-test, experimental control group model. The study employed two scales which are 15-item knowledge scale (ks) questions. The KuderRPichardson coefficient reliability was 0.86 for ks and 24 items for students attitudes scale (SAS), were selected with cronbach alpha-reliability coefficient of 0.92. The sample of the study was 341 high school students. The data collected were analyzed by using SPASS/PC version 120 statistical programs. Two different t-tests were performed. The results of the study showed that

virtual laboratory applications made positive effects on students achievement when compared to traditional teaching methods. The study is related to the present study in the sense that they were conducted within the context of laboratory work. However, the present study differs from the reviewed study because the previous study was in chemistry while the present study is biology. The present study intend to investigate the influence of biology practical activities on academic achievement of students in biology.

Ukozor (2011) carried out research on the effect of constructivist teaching strategy on senior secondary school students' achievement and self-efficacy in physics. The study employed one hundred and eight four (184) students from four (4) secondary schools. Non-equivalent control group design was adapted. Five research question were posed and three null hypothesis guided the study. Means and standard deviation was used in answering the research questions and ANCOVA was used in testing the hypothesis. A significant effect of gender on students physics academic achievement was found. In the light of the above result, therefore the present study intends to investigate the influence of biology practical activities on academic achievement of students in biology.

The researcher learnt from the study that despite the importance of the use of practical biology to enhance the academic achievement of students, it appears that many still do not use biology practical in teaching and learning of biology.

Okoh, Iwuozor & Obioma (2011) investigated gender differences in computational problems in chemistry among senior secondary school students. A total of multiple choice, pre and post achievement test items were constructed on three concepts treated in the experiment and administered to four hundred (400) SSII students drawn from twenty randomly selected secondary schools in four local government areas of Delta State. Two hypotheses were formulated and tested using the t-test at 0.05 level of significant. Analysis of the results revealed that the male students failed to achieve significantly higher in computational problems in chemistry than their female counterparts. The present study is aimed at investigating whether there is any difference due to gender by using group and individual laboratory work on students' achievement in biology.

Nwosu, (2011) examined gender differences in the utilization of information and communication technology (ICT) among undergraduate students. One research question and one null hypothesis guided the study. The sample for the study comprised hundred (100) female and male students of Faculty of Education, University of Nigeria Nsukka. The instrument for data collection was questionnaire. Mean scores and t-test statistics were used for data analysis. Result showed that female and male students utilize ICT differently and males utilize ICT more than females. Also the hypothesis showed that there is a significant difference between the mean scores of male and female students in ICT utilization for academic activities which indicate that male students use ICT more than their female counterparts. Recommendations were made based on the findings.

Considering the findings of different people above, it is clear that there is not yet a consensus as to whether gender influences science achievement or not. Some are of the opinion that males are superior to females, while others said is females and some are even neutral.

Students' performance in biology and sciences in Nigeria has remained very poor despite the heavy investment on education over the years. Parents, government, individuals and organizations including, educational institutions are not satisfied with students' performance in the Senior Secondary Certificate Examination (SSCE). This is in line with the WAEC Examiners' Report of 2000, that only few students obtained the minimum of five credits required for entry into tertiary institutions in the country. WAEC Chief Examiners' Reports (2009, 2010,2011, 2012, 2013 & 2014) revealed that students also performed poorly in some aspects of practical biology in terms of adhering to instructions, crossing of guidelines in drawing, labeling and so on.

Studies shown that teachers use mostly teacher centred approach in carrying out laboratory activities. The inappropriate instructional approaches used by secondary school biology teachers tend to raise doubts about the possibility of realizing the objectives of biology education in Nigeria secondary school as stated in the National Policy on Education (Federal Ministry of Education, 2014). Most instructional approaches such as lecture and demonstration used in teaching biology in the classroom or laboratory promote rote learning and lack of opportunity for students to manipulate materials and reflect on what they do during teaching and learning processes. Students interaction during practical activities in the laboratory could play a key role towards concretizing learning.

Other researchers such as Zaman (2014) and Chukwuneke (2016) carried out works that are related to this study but in different areas and locations. Konshisha Local Government Area of Benue State is considered as the study area because at the moment no studies related to this study known to the researchers has been carried out. Besides, the extent to which effect of practical could facilitate cognitive

attainment (i.e. performance) needs to be put on record. Therefore, the problem of the study put in question form is, what is the effect of biology practical work on performance of biology students?

Research Questions

The following research questions guided the study:

1. To what extent do biology practical activities influence students' academic achievement in biology?
2. To what extent does students attitude towards biology practical affect their performance in biology?
3. To what extent do gender influence students academic achievement in biology?

Research Method

The design adopted for the research is descriptive survey design. This design is a useful way of obtaining information about people's opinions, attitudes, preferences, and experiences simply by asking questions. This design was used for this study since a group of people have to be studied systematically by collecting and analyzing data from a chosen few considered sufficient representative of the entire population.

The population for this study comprised of all the public senior secondary school (SS2) biology students in all the public secondary school in Ikere Local Government Area of Ekiti State.

The sample for the study was made of 125 senior secondary SS II students. Simple random sampling was used to select thirty (25) students from each of the 5 schools selected for the study.

Questionnaire instrument developed by the researcher was used for the data collection. Questionnaire items were constructed to afford answer to the research questions formulated to guide the study. The questionnaire consist two sections. Section one sought information on personal data while the second section contains twenty (20) items structured to provide answers to the major research questions. Four point scale rating of Strongly Agree(SD), Agree (A), Strongly Disagree(SD) and Disagree(D) with values of 4, 3, 2, and 1 respectively.

To ensure validity of instrument, the instrument will be given to the supervisor to read through and determine the validity content of the instrument, the multiple choice items drafted will be given to Biology experts in the department of Biology to go through and make necessary corrections on the instrument. The corrections made by the supervisor and experts will be noted and will be used for the final draft of the instrument which will be presented to the project supervisor for final preparation.

In testing for the reliability, Cronbach's alpha (KR) was used. The scores were used to calculate the variances. The coefficient of reliability was 0.99.

The instrument was collected from the respondents personally by the researcher. The researcher was around to explain all forms of ambiguity that may serve as a problem to the respondents.

The data collected in the study were analyzed using mean and standard deviation. The responses from the respondents were compared, classified to the number of items in the questionnaire for each research question.

Results and Discussion

The results were presented in tables according to the research question.

Research Question 1: To what extent do biology practical activities influence students academic achievement in biology?

Table 1: Mean scores on the influence of biology practical activities on academic achievement of students in biology?

S/N	ITEMS	SA	A	D	SD	N	$\overline{X}$	DECISION
1.	Biology practical activities stimulate creativity, curiosity and critical thinking.	25	40	45	15	125	3.26	Accepted
2.	Biology practical activities promote student engagement with the scientific method.	30	60	10	25	125	2.97	Accepted
3.	Biology practical activities encourage active learning and problem solving.	40	30	25	30	125	3.28	Accepted
4.	Biology practical activities develops students interests, attitudes and values.	50	40	10	25	125	3.48	Accepted
5.	Biology practical activities promote social interaction among learners and their teacher	60	35	15	15	125	3.11	Accepted

Data from table 1 shows that high mean score items 1, 2, 3, 4 and 5 had the mean values of 3.26, 2.97, 3.28, .48, and 3.11 respectively. The value were up to 2.5 and above which was interpreted as accepted, and therefore indicates that influence of biology practical activities increase students academic achievement in biology, biology practical activities has positive influence on students by stimulate their creativities, curiosity, and critical thinking, biology practical activities promote students engagement with the scientific method, biology practical activities encourage active learning and problem solving, biology practical activities develops students interest, promote social interaction among learners and teachers.

Research Question 2: To what extents does students attitudes towards biology practical affect their achievement in biology?

Table 2: mean scores on students attitudes towards biology practical affect their achievement in biology

S/N	ITEMS	SA	A	D	SD	N	$\overline{X}$	DECISION
1.	Biology students see laboratory practical as a mere waste of time since they think that they can do without it in learning the subject.	45	40	25	15	125	2.33	Rejected
2.	Biology students placed high value in laboratory practical to attain a high achievement in the subject.	35	30	25	35	125	2.53	Accepted
3.	Biology students carry out laboratory practical for doing sake just to satisfy the teacher(s)	30	25	35	35	125	2.03	Rejected
4.	Biology students engage in laboratory practical not to learn it for future use but for sole aim of passing it in their O'level examinations.	30	25	30	40	125	2.63	Accepted
5.	Poor conception of the subject by students affects their achievement.	15	45	40	25	125	3.36	Accepted

Data from table 2 shows that high mean scores were obtained from all the five listed items. Specifically, item 1, 2, 3, 4, and 5 had the mean values of 2.33, 2.03, 2.63 and 3.36 respectively. The values were up to 2.5 and above which was interpreted as accepted, and therefore indicate that students attitudes towards biology practical negatively affect their achievement in biology, biology students see laboratory practical as a mere waste of time which negatively affect their academic achievement, which negative affect their academic achievement, biology students carryout laboratory practical for doing sake just to satisfy the teachers and poor conception of the subject by students negatively affect their achievement in biology.

Research Question 3: To what extent do gender influence students academic achievement in biology.

Table 3: mean scores on influence of gender on academic achievement of students in biology

S/N	ITEMS	SA	A	D	SD	N	$\overline{X}$	DECISION
1.	Female self perception of themselves as weaker sex, inferior affect the academic achievement in biology.	40	10	25	50	125	3.20	Accepted
2.	Nigeria homes tends to shape the girl-child away from science and science related disciplines.	25	40	30	30	125	2.65	Accepted
3.	Males tend to be dominating in competitive activities while females are always shy and may prefer working in groups or under male counter parts.	20	60	25	20	125	3.2	Accepted
4.	Gender in equality in science teaching practical and methods used by science teachers creates wider gap in their achievement.	40	25	15	45	125	3.1	Accepted
5.	Male students were superior over female students in problem solving and achievement in biology	40	25	30	30	125	2.3	Rejected

Data from table 3 shows that high mean scores were obtained fro all the five listed items. Specifically, item 1,2, 3, 4 and 5 had the mean values of 3.20, 2.26, 3.1 and 2.3 respectively. The values were up to 2.5 and above which was interpreted as accepted, and therefore indicates that gender affect students academic achievement in biology, female self perception of themselves as weaker sex, inferior affect their academic achievement in biology, gender inequality, in science teaching practical and methods used by science teachers creates wider gap in their achievement in biology.

Discussion

From the finding, practical activities influence student academic achievement on biology in senior secondary school in Ikere L.G.A. This is in agreement with that of Kiladare and okoro (2017) who established that students understands better when they involves themselves in practical experiment, thus matching theory with practical. This also affirmed that fact for an effective teaching to take place, the theoretical aspect must go inline with the practical aspect so as to attain a positive behavioral change in the life of the learner(s).

From the research question one influence of biology activities on academic on achievement of students in biology. The result reveals that Students understand well when they are been taught with practical. Biology practical helps to make abstract ideas more concrete for learners, such that basic concepts could be understood. Students should understand processes and structure; develop skills in manipulation, processing of science information and conducting scientific investigations. Hence, the teaching methods such as learners design, reciprocal, inclusion, divergent and self-check could enhance the teaching of Biology practical lessons (Capel, Least & Turner 2019).The use of practical work in teaching biology and other subjects make learning interesting and fun, keeping the student active, create a conductive atmosphere for a participation class during teaching, making students to discover facts and new ideas by themselves. The finding revealed that despite the importance of the use of practical work in the teaching and learning of biology in senior secondary schools in Ikere Ekiti.

From the research question two students attitudes towards biology practical affect their achievement in biology. From the finding biology teachers are still unable to prepare and design a robust practical or experiment for the biology lesson. Biology teachers should proficient on how to plan better steps. According to Erin & Alicia (2019) designing learning instructions, setting goals and structuring teaching steps are important; the study shows that teachers are still inefficient in handling laboratory equipment and could not manage a systematic and effective experiment.

From the research question three to what extend do gender influence students academic achievement in biology. From the finding the word gender does not mean that there are clear difference between female and male on academic achieved in biology. According to Okeke (2019) gender is a social or cultural determinant that varies from place to place or culture to culture. It is not universal, unlike sex which is biologically determined and universal. If there are differences, they are based on hierarchical structures within the culture of what is suitable for male and female respectively.

Considering the findings of different people, it is clear that there is not yet a consensus as to whether gender influences academic achievement in biology.

Conclusion

The conclusions of the research were as follows:

1. Influence of biology practical activities increase students academic achievement in biology in Ikere Local Government Area of Ekiti State.
2. The wrong attitude of students towards biology practical influences them in a negative way.
3. Students gender influences their academic achievement in biology.

Recommendations

Based on the findings, the following recommendations were made:

1. Teachers should encourage students to develop interest in practical activities by engaging them in practical and providing instructional materials that will challenge them to be actively involved during practical lessons.
2. Ministry of Education and professional organization like STAN should organize workshops, seminars and conferences for biology teachers.
3. Biology concepts should be taught with practical activities so that the students will do science instead of learning about science.

4. the government/ministry of education should provide more adequate qualified competent biology teachers to all the public secondary schools in Ikere local government area.
5. The government should provide fund for schools so as to enable them procure the relevant resources for effective teaching and learning of biology in all the public secondary school in Ikere local Government Area.

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