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Teachers' And Students' Perspectives On Challenges In Implementing The Practical Aspect Of Biology Curriculum In Secondary Schools In Osun State, Nigeria

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Abstract
The aim of the study is to identify the challenges in implementing Biology curriculum as perceived by teachers and students in Osun State, Nigeria. The research design used in the study was descriptive survey research. The population of the study were all Biology teachers and senior secondary school students in Osun State. A sample of 66 Biology teachers and 960 Senior Secondary School II students were chosen using a multistage random sampling method. Two researcher-made instruments were used to gather data, namely; the Questionnaire on Challenges on the Implementation of Biology Curriculum for Teachers (QCIBCT) and Questionnaire on Challenges on the Implementation of Biology Curriculum for Teachers (QCIBCS). Data were analysed using descriptive statistics and the Relative Significance Index (RSI). The results indicated that most of the teachers of Biology were professionally qualified (75.8%). Nevertheless, ineffective laboratory conditions, lack of sufficient and underutilized lab materials, large classes, inadequate teacher morale, a lack of qualified staff, lack of time in practical performance and usage of demonstration and activity-based instructional models were some of the key challenges pointed out by both the teachers and students. The research concluded that despite the existence of qualified teachers, systemic, instructional, and resources related issues make it difficult to implement the practical part of Biology curriculum. It thus recommended better laboratory facilities, teacher motivation, hiring more qualified teachers, and application of learner-focused and practice-based modes of instruction to enhance the curriculum implementation of Biology.

Key Words: *Curriculum, Curriculum Implementation, Laboratory equipment, Biology practical, Qualified teachers, practical periods, Teachers' perception, Students' perception*

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I. Introduction

Biology stands on a special place in the science curriculum of secondary schools. It is a prerequisite to the study of other science-related careers such as medicine, nursing, pharmacy, agriculture, microbiology among others (Ayanda, Olayinka & Adeoye, 2020). The biology curriculum is created to ensure that students acquire inquiry skills and further their knowledge on biological sciences. Academic performance of those students enrolled in biology has not been promising in research studies over the years (Chukwu & Arokoyu 2019; Goji, 2018; Joda, 2019; and Olugbuye, 2017). According to the reports on the West African Senior School Certificate Examination (WASSCE) provided in 2018-2022, pass rates vary, and failure rates are more than 40 percent each year (WAEC, 2023). Adolphus (2018) also noted that less than 45% of the biology students taking credits pass the credits in order to get admission to the universities. Such a state of things can be readily explained by the variety of reasons including poorly trained and unqualified teachers in Biology, the unavailability of practical equipment and the absence of laboratory (Adeyemo, 2017). Biology is a practical science subject that demands practical activities of the students in its teaching and learning. The proper and standard Biology experiments that also can be regarded as an essential element of the national curriculum of Biology are not merely motivational and fun, but they empower students in how they can apply and extend their insight and knowledge of the learned concepts in the classrooms that consequently is capable of developing their critical thinking skills and strengthening their interest in biology learning (Bukoye, 2019). A major reason behind the interest and motivation of students is through practical working in this way, arousing a lasting interest in the field of biology. Hands-on activities (practical work) are an important aspect as far as the study of natural sciences (biology, chemistry and physics) is concerned. It is premised on the belief that scientific skills can be better acquired through doing so. The hands-on approach can arouse the student's interest in the subject matter, impart laboratory skills, improve the process of learning, and provide the insight in the development of the scientific attitudes and skills. According to Akinwumi and Falemu (2020), the desire to study biology is not always determined by the interests that the students bring to school. It may also be the consequence of some learning situations, and one of them is the work in a laboratory. Opuh, Eze, and Ezemagu (2018) posits that practical work is generally carried out within the

science in schools because of multiple reasons. Part of the reasons are in order to make phenomena more real with experience and create some attitudinal critical and disciplined positions. It was sad to learn that though teachers were using practical lessons to ensure that their students achieve better results in biology, in most of the schools, the biology laboratories were used in instruction of theoretical lessons and not practical lessons, possibly because of the poor condition of the laboratories that lack the materials and equipment needed to conduct practical lessons, which in turn can influence the effective and proper implementation of the Biology curriculum (Niazi, Asghar, and Ali, 2018).

Curriculum implementation is where both learning activities, teachers and learners are engaged in negotiation, which is expected to foster learning. It is also worth mentioning that regardless of how developed and comprehensive a curriculum is, it can only be successful in a case when the teachers implementing it are good (Tom-Lawyer, 2015). The teacher is the greatest implementer of the curriculum as whatever the teacher does in the classroom on the curriculum would determine whether the set objectives would be met or not. Such factors as the interest of students and their readiness and more importantly the physical environment (availability and adequacy of learning materials and equipment) might be limiting, but an informed and skilled teacher could always make the most out of any situation. Annune (2021), emphasized the fact that the problem of trained teachers to instruct the science subjects in theory and in practice is a very acute issue since the task to prepare and to re-train the science teachers in the schools has not brought any positive outcomes. This does not augur well with an effective delivery of the senior secondary school biology curriculum. Despite the strategic position of biology teachers in the effective execution of Biology curriculum, research findings that include Imanda (2020) and Abdussemiu, (2022) indicate that the majority of schools in Nigeria do not have qualified science (Biology) teachers, the majority of schools hire individuals who are not trained in the subject to instruct their children since most of them are not aware of the concepts and application in the classroom context. The quality of a teacher has quite a long way to go in determining the quality of products coming out of schools in the overall society. The objectives of Biology curriculum in secondary school in Nigeria as listed by the Nigerian Educational Research and Development Council (NERDC, 2008) are as follows: Adequate laboratory and field skills in Biology; meaningful and relevant knowledge that is Biological; ability to apply scientific knowledge to daily life as applied to personal and community health and agriculture and reasonable and useful scientific attitude. As Hamunyela et al. (2022) noted, both of the main guidelines were expected to offer a student-centered learning experience that can meet the needs of individual students by applying differentiated instructional strategies, and to be able to deliver an outcome based, high- quality curriculum. The curriculum requires teaching and human resources to make the complete transition of a teacher-centered instructional method which is based on memorization into an inquiry method of teaching the student to achieve his/her scientific knowledge and competencies. Only in the science classrooms like laboratories, this may be done.

In order to experience any meaningful biological development in our society, the concept of Biology should be taught well and efficiently in secondary schools and the manner in which curriculum is being executed will dictate the way in which goals and objectives of the curriculum will be acquired. In order to realize this, it will be impossible to overemphasize the frequent and regular review of the biology curriculum.

Statement of the Problem

The curriculum offered by the Nigerian senior secondary school biology aims at cultivating the skills of an inquiry, practical competence, scientific attitude, and meaningful knowledge of the biological concepts (NERDC, 2008). Yet, the evidence of a rising discrepancy between the intentions of the curriculum and the classroom realities has been observed. Teaching in biology is mostly theoretical in most schools, with students having few laboratory and field experiences (Niazi et al., 2018).

Some of the studies have cited a shortage of well-equipped laboratories, no practical teaching material, insufficient qualified biology educators as well as ineffective teaching methods as some of the causes of poor achievement in biology (Adeyemo, 2017; Imanda, 2020; Abdussemiu, 2022). Some of the schools do not have their biology laboratories or convert them to normal classrooms, which denies the students the much-needed practical experience. Therefore, students cannot acquire the skills of science, critical thinking and long-term interest in the subject.

Although the aspects that influence biology achievement have been explored in the past, there is very little empirical research that could provide the concomitant view of both the teachers and students regarding the issues that surround the implementation of the biology curriculum. This research thus examines the issues of implementation of the practical aspect of the biology curriculum as a teacher and a learner in secondary schools.

Research Objectives

The main aim of the study is to identify the challenges in implementing Biology curriculum as perceived by teachers and students in Osun State, Nigeria. Specifically, the study seeks to:

(i) assess the quality of Biology teachers (qualification) in senior secondary schools in Osun State;

(ii) identify the challenges in implementing Biology curriculum as perceived by teachers in the study area; and
(iii) identify the challenges in implementing Biology curriculum as perceived by teachers in the study area.

Research Questions

(i) How qualified are teachers that implement Biology curriculum in senior secondary schools in Osun State?
(ii) What are the challenges facing the implementation of Biology curriculum as perceived by teachers in the study area?
(iii) What are the challenges facing the implementation of Biology curriculum as perceived by teachers in the study area?

Implementation of Biology Curriculum in Nigeria.

The biological curriculum is aimed at providing students with the science knowledge, skills, to continue their learning to higher education and the attitudes that they are required to pursue in response to the needs in society, ensuring the environment is sustainable, and economical (Akintola, 2017). The National Policy on Education (FRN, 2013) states that learning Biology provides students with the necessary laboratory and fieldwork capabilities, relevant and significant knowledge in the field, as well as with knowledge of science which is useful in health, agriculture, and personal life and community in general. Also, it promotes the emergence of practical scientific attitudes (Akintola, 2017).

Certainly, the teacher is the most critical part of the curriculum implementation process because teachers, with their expertise, experience, and competencies, become the part of any curriculum development initiative (Alsubaie, 2016). Effective teachers improve the quality of learning because they not only have the best knowledge of the teaching practices but also have the main task of providing the curriculum in the classroom (Munna & Kalam, 2021).

On the one hand, when some other body creates a curriculum, the teachers must put in efforts to study it and internalise it. Thus, the role of teachers in the development of the curriculum is essential. Their ability to support the curriculum design with the insights and opinions of the teachers is a key aspect of its success (Pandian, 2024). In addition, the curriculum development team should be aware of teacher as an important aspect of the educational setting which affects the curriculum (Carl, 2009). Therefore, the involvement of teachers is crucial to the effective and meaningful curriculum development because they are the most critical implementers in the last phase of the curriculum development process (Alsubaie, 2016).

Issues Affecting the Implementation of Biology Curriculum.

Conducive learning environment is one of the factors that influence quality of any kind of education especially in Nigeria because there are several factors that hinder the implementation of the curriculum in Nigeria; one of them being inadequate infrastructure among others. Xu, Schoenrock-Adema Jaarsma, Duvivier and Bos (2022) thought that, as conducive learning environment can be in a given context, especially when it comes to colleges; means the provision of adequate facilities such as laboratory, workshop equipment and consumable, these provisions and services is a requirement of good quality teaching and learning.

One of the key problems encountered during the use of the biology curriculum in Nigeria is the inadequacy of facilities and resources. Schools usually do not have the necessary laboratory equipment, chemicals, reagents and teaching aids that are needed in effective practical sessions, which is a very important part of the Biology teaching. Akintola (2017) states that most schools in Nigeria are poorly equipped in terms of laboratories, and some even do not have any whatsoever. Hands-on learning is critical in grasping the biological concepts and principles, and this is not possible due to this deficiency among the students.

Teacher training is also another major problem in implementation of biology curriculum. Curriculum implementation depends to a large extent on the ability of the teachers who will provide the content. Research has revealed that a small percentage of Biology educators in Nigeria are not only not well trained in modern teaching practices, but also lack the ICT skills required in the application of ICTs as a teaching tool (Bello, Ahmed, Alabi, Ahmed, Bello, and Bello, 2017). The result of this insufficiency in training is the ineffective delivery of instruction and excessive dependence on rote learning, which negatively affects the goal of the curriculum of teaching critical thinking and problem-solving to students (Palavan, 2020).

Biology curriculum is often over- stuffed with the content of most of which is of trivial relevance as well as being entirely inaccessible within the time limit. According to Osuji and Oluoch-Suleh (2017), the percentage of teachers who taught two out of three science (Biology) curriculum in the Senior Secondary One (SS 1) was only a minority. Any curriculum covering initiative is bound to exert pressure on teachers as well as the students and also this undermines other school programmes. They further highlighted that many problems accompany volumetric content of curriculum in biology such as lack of depth in practical work by the teachers, bombarding the students with too many concepts at the same time, poor teaching, and even poor assessment. The results of the studies revealed that there is less time that is taken during teaching and learning of biology and science in

general. Comparison of Biology curriculum of the Nigerian secondary schools, emphasis on practical class is not distinctly emphasized and planned. According to Opuh, Eze and Ezemagu (2018), the two single periods and one double period allocated to the science subject matter, implies that science subjects are being taught thrice a week. The two period was to be practically used in a way that would show concepts that are not practiced within most schools. We might have to take time in teaching biology so as to spur our scientific and technological advancement. Opuh, Eze and Ezemagu (2018) claim that any topic that involves hands-on activities takes more time than the one that involves theoretical work. It is observed that, unless one has enough time to teach and learn biology, even other factors like the provision of adequate laboratory facilities, and enough qualified teachers of science will not make space through which meaningful learning will take place.

The motivation of teachers is very crucial to the overall performance of the implementation of Biology curriculum. This is done to take care of their well-being that incorporates professionalization that involves introduction of Teachers Salary Structure (TSS), paying science allowance, science workshops, seminars and conferences regularly to ensure that quality is upheld in their work. This is not easily achieved in the Nigeria education system and this has impacted negatively to their performance. Olayinka (2019) added this finding when they pointed out that the teachers have been relegated to the back burner in the job-nonreflective remuneration ladder.

Over the past few years, science educators have laid a lot of stress on use of new instructional techniques, such as: discovery, inquiry, laboratory, demonstration among others to impart meaningful learning to the students Okafor (2021). The devastating fact as presented by Nwabueze (2018) is that expository type of instruction has been the most prevalent in schools ever since the first school was opened in 1843. According to Nwobieze (2018), lecture method has been one of the primary methods of information delivery to students, and consequently, it became extremely popular and popular among students of sciences. His other discovery was that teachers did not like activity-based teaching methods that have already demonstrated to be productive and implemented the methods that are simple yet, in the majority of cases, unsatisfactory and inappropriate. This is among the biggest impediments to Biology teachers.

Additionally, the socio-cultural factors are also involved in the problems when implementing the biology curriculum. In some areas of Nigeria, the traditional beliefs and practices have clashed with the scientific explanations provided in biology curriculum particularly in matters relating to evolution, reproduction and health education. These cultural barriers can cause the development of some culture of resistance by the students and parents involved that will further complicate the teaching and learning process.

II. Methodology

The study adopted the descriptive survey research design. The population of this study consisted of all Biology teachers and students in Senior Secondary Schools in Osun State. The sample comprises of 66 secondary schools' biology teachers and 960 students which were selected using the multi-stage random sampling procedure. From the three Senatorial districts in the state, four Local Government Areas (LGAs) each were randomly selected, making a total of twelve LGAs. From each of the twelve LGAs chosen, four senior secondary schools were selected using simple random sampling technique making a total of fourty-eight schools. From each of the selected secondary schools, 20 Senior Secondary School Two (SSS II) students were selected using the simple random sampling technique, and all Biology teachers in the selected schools were chosen as sample for the study.

Two instruments were used to collect data for the study, which are:
a) Questionnaire on Challenges of the Implementation of Biology Curriculum for Teachers (QCIBCT)
b) Questionnaire on Challenges of the Implementation of Biology Curriculum for Students (QCIBCS)

The QCIBCT was designed by the researcher to gather detailed information from teachers regarding the time devoted to biology practicals, challenges, and overall experience and challenges with the implementation of the biology curriculum in Osun State. It consists of two sections. Section A required the teachers to provide demographic information such as qualification, time devoted to practical activities weekly and termly, while section B consisted of Twenty (20) items on challenges faced by teachers in implementing the biology curriculum. Each of the items were subjected to four Likert-like rating scale of Strongly Agree (SA); Agree (A); Disagree (D); and Strongly Disagree (SD). The QCIBCS was designed to gather feedback from students about their experiences with the implementation of the biology curriculum, especially, biology practicals, availability of equipment used in practicals and the challenges faced during practical sessions. The QCIBCS consisted of two sections. Section A required students to provide demographic information while section B consists of Eighteen (18) items on students' evaluation of teaching and practical sessions. Each of the items was subjected to four Likert-like rating scale of Strongly Agree (SA); Agree (A); Disagree (D); and Strongly Disagree (SD).

Validation and Reliability of Instruments

The instruments were presented for face and content validity to the researcher's supervisor and two other lecturers in the Department of Science and Technology Education, Faculty of Education, Obafemi Awolowo University, Ile-Ife and two experts in the field of Tests and Measurement. Necessary corrections were made in line with the suggestions made by the supervisorial aspects.

Pilot testing of the instruments was carried out by administering the instruments on 20 teachers and 153 students in schools outside the study area.

After pilot testing, the reliability of the QCIPCT was obtained using Cronbach's alpha coefficient which revealed a value of 0.528. Split-halves value obtained were 0.840 and 0.753 for first and second halves respectively. The Guttman value for the QCIBCT is 0.815, which shows that the instrument is adequate to collect data for this study. Also, the reliability of the QCIPCS was obtained using Cronbach's alpha coefficient which revealed a value of 0.824. Split-halves value obtained were 0.673 and 0.757 for first and second halves respectively. The Guttman value for the QCIBCS is 0.768, which shows that the instrument is adequate to collect data for this study.

In collecting the data for the study, the researcher visited the schools with a letter of introduction to the principals who then granted access to the respondents to respond to the instrument. Administration of the instrument to the respondents was done with the help of research assistants trained by the researcher. The instruments were collected immediately they were completed. Data were collected with the aid an observation checklist and well–structured questionnaires. The questionnaires were administered to the respondents who were Biology teachers and students in forty-eight selected senior secondary schools in Osun State. The researcher sought the indulgence of the respondents by stating the purpose and relevance of their responses by meeting with them in their offices and classrooms. Questions raised were answered using descriptive statistics such as frequency counts, and Relative Strength Index (RSI) in order to determine the challenges facing the implementation of biology curriculum in secondary schools in Osun state.

III. Results

Research Question One

How qualified are teachers that teach Biology in senior secondary schools in Osun State?

To answer this question, item 3 under Section A of the teachers' questionnaire which addressed Highest Qualification of the teachers was employed. This was subjected to descriptive analysis and the result is presented in Table 1.1

Table 1.1: Qualification of teachers that teach Biology in Osun State Senior Secondary Schools

Qualification	Frequency	Percent
NCE	02	3.0
B.Ed./B.Sc. Ed	50	75.8
B.Sc.	10	15.2
B.Tech	01	1.5
PGDE	01	1.5
OTHERS	02	3.0
Total	**66**	**100.0**

Table 1.1 presented the results of the qualifications of the teachers who teach Biology in secondary schools in Osun State. On the Table, majority of the teachers (75.8%) had Bachelor degrees in Education and Bachelor of Science in Education (B.Ed./B.Sc. Ed). This was followed by 15.2% of the respondents who possessed Bachelor of Science. Others include teachers with NCE (3.0%), Bachelor of Technology (1.5%) and Postgraduate Diploma in Education (1.5%). From this, it can be deduced that most of the teachers teaching Biology in Osun State secondary schools are well qualified to do so.

Research Question 2

What are the challenges facing the implementation of Biology curriculum as perceived by teachers in the study area?

To answer this question, Section B of the teachers' questionnaire which addressed the challenges faced in the implementation of Biology curriculum was adopted. In scoring the respondents' responses to the items in this section, a score of 4 was allotted to Strongly Agree, a score of 3 was allotted to Agree, a score of 2 was allotted to Disagree and a score of 1 was allotted to Strongly Disagree. These were subjected to descriptive statistics. In order to understand the importance of each item among all the other items, the responses were further subjected to Relative Significance Index (RSI). Results from teachers' responses were presented in Table 1.2 below;

Table 1.2: Teachers' perspectives on the challenges faced in the implementation of the Biology curriculum

S/N	ITEMS	Strongly Disagree	Disagree	Agree	Strongly Agree	RSI	Rank
1	I ignore some aspects of the content of biology practical due to lack of proper understanding of the topics	06 (13.0)	12 (26.1)	17(37.0)	11 (23.9)	0.571	7
2	Laboratory equipment in my school are inadequate	04 (8.7)	20 (43.5)	17(37.0)	05 (10.9)	0.625	5
3	Lack of competent hands to take practical classes create stress for the few ones available	09 (19.6)	17 (37.0)	12(26.1)	08 (17.4)	0.647	4
4	The laboratory is not well-ventilated	13 (28.3)	20 (43.5)	09(19.6)	02 (4.3)	0.750	1
5	Laboratory rules and safety procedures are not adequately provided by the school authorities	17 (37.0)	16 (34.8)	12(26.1)	01 (2.2)	0.484	11
6	Students are not always serious in practical classes	05 (10.9)	14 (30.4)	20(43.5)	07 (15.2)	0.658	3
7	I wish to handle practical classes well but there are no enough equipment to cater for practical activities	13 (28.3)	20 (43.5)	07(15.2)	06 (13.0)	0.533	8
8	I am not well motivated to lead students in carrying out practical activities	04 (8.7)	11 (23.9)	20(43.5)	10 (21.7)	0.700	2
9	Incentives from the school authority to biology teachers for practical activities are not enough	08 (17.4)	16 (34.8)	13(28.3)	08 (17.4)	0.617	6
10	Arranging practical classes for my students frequently is a challenge	17 (37.0)	26(56.5)	02(4.3)	0.0(00)	0.417	14
11	I find it difficult to engage my students very often in practical activities	15 (32.6)	24 (52.2)	05(10.9)	01 (2.2)	0.456	13
12	I find guiding students on what to do during practical classes with	17 (37.0)	15 (32.6)	09(19.6)	04 (8.7)	0.500	9

	demonstration tasking and time wasting						
13	I rarely improvise materials for practical classes	24 (52.2)	19 (41.3)	03 (6.5)	00 (0.0)	0.386	17
14	I do not enjoy teaching biology as a subject	27 (58.7)	17 (37.0)	02 (4.3)	00 (0.0)	0.364	18
15	Lack of laboratory attendant in my school affect practical activities	14 (30.4)	22 (47.8)	08(17.4)	02 (4.3)	0.489	10
16	I hardly have the time to allow students to actively participate by asking and answering questions during practical classes	26 (56.5)	19 (41.3)	01 (2.2)	00 (0.0)	0.364	18
17	All my students do not see me when I demonstrate in the laboratory	30 (65.2)	15 (32.6)	01 (2.2)	00 (0.0)	0.342	20
18	I do not take time to explain difficult concepts to my students during practical classes	22 (47.8)	21 (45.7)	01 (2.2)	01 (2.2)	0.394	16
19	My students have not acquired adequate scientific skills in Biology	14 (30.4)	26 (56.5)	03 (6.5)	02 (4.3)	0.461	12
20	Synergy between laboratory experiments the curriculum content is challenging	22 (47.8)	18 (39.1)	06(13.0)	00 (0.0)	0.413	15

Table 1.2 above presented the results of the challenges confronting Biology curriculum implementation as indicated by teachers. On the Table, laboratory not well-ventilated ranked as 1st, with RSI 0.750. This was followed by teachers not always well motivated to lead students in carrying out practical activities which ranked as 2nd, with RSI 0.700. Students not always serious in practical classes ranked as 3rd, with RSI 0.658. Lack of competent hands to take practical classes create stress for the few ones available ranked as 4th, with RSI 0.647. Laboratory equipment not being adequate ranked as 5th, with RSI 0.625. The least on the Table include teachers rarely improvising material for practical classes which ranked 17th, with RSI 0.386, followed by teachers' hardly having the time to allow students to actively participate by asking and answering questions during practical classes which ranked as 18th, with RSI 0.364, followed by teachers not enjoying teaching biology as a subject which equally ranked as 18th and students not seeing teachers when demonstrating in the laboratory which ranked as 20th with RSI 0.342. From this, it can be deduced that most of the challenges facing the implementation of Biology curriculum in the study area according to the teachers are personnel and lack of equipment/resources.

Research Question Three

What are the challenges facing the implementation of Biology curriculum as perceived by students in the study area?

To answer this question, Section B of the students' questionnaire which addressed the challenges faced in the implementation of Biology curriculum was adopted. In scoring the respondents' responses to the items in this section, a score of 4 was allotted to Strongly Agree, a score of 3 was allotted to Agree, a score of 2 was allotted to Disagree and a score of 1 was allotted to Strongly Disagree. These were subjected to descriptive statistics. In order to understand the importance of each item among all the other items, the responses were further subjected to Relative Significance Index (RSI). Results from teachers' responses were presented in Table 1.3 below;

Table 1.3: Students' perspectives on the challenges faced in the implementation of the Biology curriculum

S/N	ITEMS	Strongly Disagree	Disagree	Agree	Strongly Agree	RSI	Rank
1	My school does not have enough equipment in our laboratory	272 (29.0)	409 (43.6)	190 (20.3)	63 (6.7)	0.512	12
2	My school do not have a standard laboratory	219 (23.4)	471 (50.3)	203 (21.7)	42 (4.5)	0.518	11
3	The equipment in our biology laboratory are not easily accessible	143 (15.3)	274 (29.2)	381 (40.7)	131 (14.0)	0.635	6
4	I do not like to attend biology practical classes	427 (45.6)	432 (46.1)	43 (4.6)	26 (2.8)	0.411	18
5	What we do in biology practical classes is not related to the topics taught in the classroom	408 (43.5)	449 (47.9)	47 (5.0)	31 (3.3)	0.420	17
6	Biology practical does not take place frequently in my school	223 (23.8)	404 (43.1)	243 (25.9)	66 (7.0)	0.541	9
7	I do not enjoy to conduct practicals in groups	378 (40.3)	434 (46.3)	75 (8.0)	43 (4.6)	0.442	16
8	I lack adequate motivation to join biology practical classes	256 (27.3)	317 (33.8)	206 (22.0)	149 (15.9)	0.567	8
9	In my school, biology practicals are conducted only when examination is approaching	128 (13.7)	147 (15.7)	431 (46.0)	226 (24.1)	0.703	5
10	Available materials in our biology laboratory are not utilized by our teachers during practicals	79 (8.4)	220 (23.5)	410 (43.8)	224 (23.9)	0.709	4
11	Biology practical does not contribute greatly to my performance in examination	381 (40.7)	397 (42.4)	108 (11.5)	48 (5.1)	0.453	15
12	Government/school authorities do not supply laboratory equipment from time to time	217 (23.2)	311 (33.2)	225 (24.0)	178 (19.0)	0.598	7
13	During biology practicals, my teacher only writes instructional guide on the given specimen without any proper explanation and demonstration	123 (13.1)	157 (16.8)	362 (38.6)	292 (31.2)	0.720	3
14	Our biology practical classroom is too large	98 (10.5)	169 (18.0)	383 (40.9)	279 (29.8)	0.727	2

	for our teacher to handle						
15	I am not always happy in biology practical classes compared to other science practicals	260 (27.7)	401 (42.8)	188 (20.1)	80 (8.5)	0.524	10
16	I feel I have not acquired adequate laboratory skills in Biology	238 (25.4)	491 (52.4)	149 (15.9)	52 (5.5)	0.504	13
17	I can hardly see my teacher when demonstrating during biology practical classes	300 (32.0)	451 (45.1)	135 (14.4)	43 (4.6)	0.479	14
18	My teacher hardly take time to explain difficult concepts to us during biology practical	83 (8.9)	122 (13.0)	369 (39.4)	357 (38.1)	0.769	1

Table 4.10 presented the results of the challenges confronting Biology curriculum implementation as indicated by students. On the Table, biology teachers hardly taking time to explain difficult concepts during practical classes ranked as 1st, with RSI 0.769, followed by biology practical classroom being too large for teachers to handle, as this ranked as 2nd, with RSI 0.727. Teacher only writing instructional guide on the given specimen without any proper explanation and demonstration during biology practical ranked as 3rd, with RSI 0.720. Available materials in biology laboratory not being utilized by teachers during practical ranked as 4th with RSI 0.709, also, biology practical being conducted only when examination is approaching ranked as 5th, with RSI 0.703. The least on the Table include students not enjoying to conduct practical in groups which ranked as 16th, with RSI 0.442, followed by what students do in biology practical classes not becoming related to the topics taught in the classroom which ranked as 17th, with RSI 0.420. Students not liking to attend biology practical classes which ranked as 18th, with RSI 0.411. From these, it was deduced that most of the challenges facing the implementation of Biology curriculum in the study area according to the students are perceived abilities of their teachers and lack of equipment/resources.

IV. Discussion

The finding showed that, the majority of the teachers teaching Biology in the Osun State secondary schools are qualified to teach the subject. This research will define a qualified teacher as one that possesses a teaching certificate and/or at least a bachelor degree in Education or Science Education. Lee and Lee (2020) have highlighted that teacher qualification is important in facilitating learning among students in different subjects as they are the one who implements the curriculum. This finding is consistent with the results of Akintola, Ayanlola and Sulaiman (2021), who theorized that the qualification of teachers would affect knowledge of the biological drawings that students in senior schools have. The result is also consistent with that of the research conducted by Omosewo and Abimbola (2007) which indicated that the academic qualification of teachers was a requirement in terms of performances of the students in physics at the secondary school level of study. Moreover, the result is consistent with those of Igomu, Aondulumun and Aboki (2023) who had hypothesized that qualification of teachers plays a significant role in the implementation of biology curriculum. The finding is in conflict with the results found by Mimi and James (2014), which pointed out that most of the teachers lacked qualification in teaching biology in the study area. The outcome of the study was also contrary to the results of Adeuya (2020) who found out that fewer than half of the biology teachers had the qualifications to teach biology in the senior secondary schools.

In addition, Results indicated that the majority of the difficulties that are occurring in Biology curriculum implementation in the research area based on the views of the teachers and the students involve perceived teacher abilities, staff and insufficiency of equipment/resources. Poor physical laboratory environment that is ranked as the highest depicts a challenge in the implementation of biology curriculum in secondary schools. The results claimed the results of Akinbobola (2015), who argued that the environment of science laboratory has a significant influence on the academic performance of students in science. This was evidenced by the result of Niazi, Asghar, and Ali (2018) who found out that students with access to better laboratory facilities and environment in urban areas, performed better in the achievement test than their counterparts in rural areas. The low motivation of teachers to take students into real life activities was also rated highly as a challenge towards the implementation of biology curriculum. The education and training process requires the motivation of a teacher.

This supports the claim made by Ozbilen, Ozturk and Sahin (2020), that teacher motivation has a positive influence on all the issues associated with the education and training process. This finding is consistent with findings by Otaru, Bernard and Omokida (2019) who found that motivation among teachers plays a major role in determining the academic performance of the students in biology. Another outcome was that there were no competent hands and this left few hands that were making the difference between those who were most needed and those who were not. This was the reason why there was an ineffective interaction and lack of scientific skills by the teachers. Duru, Dominic, Udoha and Ochuba (2020) noted that teachers play a decisive role in determining the quality of teaching and learning that takes place, especially science classes. Moreover, this finding concurs with their claim that teacher subject mastery contributes largely in determining the performance of students in secondary schools. The findings also coincide with the one of Erikwe, Dirisu and Ogunbayo (2020) that indicates that subject mastery, skill set, attitude to work, and academic performance of the students of the biology teachers have significant relationship. The behavior of some of the students in the practical classes, as depicted in the output is detrimental, and it might be attributed to some forces like background of the students and some of the teachers. When students are enthusiasts of learning and their studies have a value, then they will be more willing to take part in the classroom learning activities and excel in the studies. This is consistent with the claim made by Nuru and Arome (2024) who have reiterated that there is a strong positive relationship between the attitude of students and their academic performance.

Furthermore, the study findings indicated that the use of the available laboratory facilities by teachers were poor in most schools. The effective and qualitative science education, which is inclusive of biology, relies on the use of laboratory resources and facilities. Isma and Lukman (2022) hypothesized that the significant obstacles to successful delivery and use of materials were lack of finances, high numbers of students in classes, inadequacy of supervisory elements, inexperience in the application of resources, inaccessibility and insufficiency of lab resources and unprovided training of Biology teachers in-service. This claim was supported by the research findings of Dike and Salisu (2015), as the researchers found out that incompetent laboratory facilities influence effective use of resources that subsequently, influence academic performance of students. The finding is also consistent with the findings by Harrison, Iliya and Amidu (2015) who claim that the laboratory resources are also available but underutilised.

The outcome also presented the fact that laboratory resources are not sufficient and adequate. The ones that exist in most schools are insufficient. Learning and teaching can only give desired outcome when teaching materials are well given. This is backed by the results of Dike and Salisu (2015) who discovered that lack of sufficient laboratory facilities has a detrimental impact on teaching and learning that can have a severe negative influence on student performance. In addition, in his research, Kayode, Ogundokun, Mohammed and Olorundare (2020) hypothesized that lack of quality laboratory resource led to poor teaching and learning. In addition, the finding showed that teachers simply write instructional guide on the assigned sample with no proper explanation and demonstration in biology practical, which may be due to the short period of time allocated to practical classes or the class size or incompetence and lack of skill of teachers to deliver instruction. Such a claim was corroborated by the research conducted by Olayinka (2019) which indicated that the population of the biology class was more than 50 as indicated. In the case where there was a single teacher with an extra-large group of biology, there would not be effective and comprehensive work in both theory and practical work as it would be extremely hard to have the teacher attend to every student within a limited period of time. This goes against the suggested norm provided by Federal Ministry of Education (2002). As well, in evaluating the strategies employed by teachers in teaching biology in high schools, the expository strategy is the most common one that does not only promote rote learning but constrains the ability to think critically and be creative by the students. Demonstration in teaching increases and solidifies the knowledge of the students. The study by Adamu (2018) confirmed this conclusion by showing that the demonstration method of instruction was helpful in simplifying the complex biological processes. This was also confirmed by the results of Ekwe, Nwakaego and Ukwu (2023), who found out that demonstration instructional strategy simplified complicated concepts. Thus, when teachers invest time in showing the procedures and experimentation, students will learn biological process so easily and therefore, students will have positive impact on their academic performance in the subject.

V. Conclusion And Recommendation

Based on the results of this research, it was determined that the majority of teachers who teach biology in the study area are qualified to teach it. More so, the research concluded that biology curriculum was not properly implemented in the area of the research based on the perceived ability of the teachers, staff, and unavailability as well as insufficiency of laboratory facilities. The government and school administrators must be able to fund the acquisition of the necessary laboratory equipment, specimens, reagents, and instructional materials. Moreover, the physical laboratory facilities should be improved to ensure that they are safe, have sufficient space, ventilated and functional to facilitate good practical activities. In addition, better welfare packages and incentives schemes should be provided to motivate Biology teachers. The activity and learner-centered forms of instruction should also be adopted by the teachers that can create interest and active participation among the students.

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