

**AVAILABILITY AND ACCESSIBILITY OF INSTRUCTIONAL MATERIALS FOR TEACHING  
BIOLOGY IN SECONDARY SCHOOLS IN ORUMBA NORTH LOCAL GOVERNMENT AREA  
OF ANAMBRA STATE**

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**Abstract**

*The study examined the availability and accessibility of instructional material in teaching and learning of biology in Orumba North Local Government Area of Anambra State. Descriptive survey research design was adopted in the study. The population of the study consisted of all 13 principals and 25 biology teachers within the 13 public secondary school in Orumba North Local Government Area of Anambra State, therefore, there was no sampling. Structured questionnaire and checklist were used, which were face and content validated by two experts in test and measurement, and one specialist in Science Education Department of Chukwuemeka Odumegwu Ojukwu University. The reliability of the instrument was determined using Cronbach's alpha ( $\alpha$ ) and coefficient reliability of 0.88 was obtained. The questionnaires and checklist were administered to the principals and biology teachers and were collected by the researcher. Data collected were analyzed using frequency percentages. The findings therefore revealed that, the availability of instructional materials in these schools is poor. It also revealed that biology teachers do not have much access to the available instructional material.*

**Keywords:** Availability, Accessibility, Instructional Material, Teaching, Learning

**Introduction**

Education has remained a social process in capacity building and maintenance of society for decades. It is a weapon for acquiring skills, relevant knowledge and habits for surviving in the changing world. It is the cornerstone of any country's development. Indeed, education continues to be the instrument for achieving economically, scientific and technological growth and development of any nation. The Federal Republic of Nigeria (2004) in her National Policy on Education viewed education in Nigeria as an instrument "par excellence" and that which effects change and development both for the individual and for the nation.

Science which is an integral part of education is a systematic knowledge of the physical or material world gained through observation and experimentation (Harper & Douglas 2014). Trivedi (2020) viewed

Science as a way of acquiring reliable, valid, and practical knowledge about our world. Opara and Eleanya (2022) opined science to mean a dynamic process of discovering what is the universe and how those things work today, how they worked in the past and they how they are likely to work in the future. It involves a body of knowledge about plants with its flower and fruits (botany) as well as the study of animals, otherwise known as zoology. Both botany and zoology are the two branches of knowledge constituting the subject matter of science called biology.

Biology has been the bedrock of understanding life, treating ailment and maintenance of ecosystem. It is a branch of science that explains the structure, function, development and existence of living things and as well provides a justification for their interaction with nature (Abanikannda, 2018). Biology is a subject taught in secondary school, monotechniques, Polytechniques, colleges of education and universities because of its importance. In the view of Nnorom and Okosi (2018) the study of biology aims to increase the understanding of living systems and allows one to consider the systems in relationship to the self and other organisms in the natural environment. However, research has shown that secondary school students perform poorly in biology because of lack of practices (Adebanjo, 2019; Nnorom & Okosi; Raji, 2017). According to Ivowi (2016) biology teaching requires more of practical work and experiment. However, most secondary schools lack well equipped laboratories to conduct practicals as they do not have standardized or accredited instructional materials in these laboratories.

Instructional materials bridge the gap between the teacher and the learner. It reduces the chalk-talk syndrome that involves only the learner's sense of hearing and makes dynamic learning experience more concrete and realistic (Mohammed, 2018). This helps to keep the interest and attention of the learner as Chinese adage would say: "I hear, I forget, I see I remember, I do I understand. Instructional materials have been described by different scholars. According to Abdulahi (2010) instructional materials are tools locally made or imported that help to facilitate the teaching/learning process. They are materials made use of by instructors or teachers in imparting information in terms of academic subjects and concepts to the students. (Kapur, 2020). Ordu (2021) viewed instructional materials as instructional aids like book, chalk board, picture or objects that help the teacher to effortlessly carry out the teaching-learning process. Bukoye (2019) referred to instructional materials to include print and non-print items that are designed to impact information to students in the educational process.

According to Njoroge (2019) instructional materials are classified into three main categories: Visual aids, Audio aids and Audio-visual aids. Visual materials appeal to the sense of sight. For example :- actual objects, models, pictures, charts, maps, flash cards, flannel board, bulletin board, chalkboard, overhead projector, slides etc. Audio instructional materials are those materials that occur basically in the auditory sense. Examples of this type of instructional material are radio, tape, recorder, speaker etc. The audio-visual materials as the name implies are those materials that occur both to the sense of auditory and to the sight. Examples are television, telegram, video etc. Instructional materials like this audio-visual materials heighten motivation for learning through its concreteness and interest, provides freshness and variety in teaching and learning process. The use of the above instructional materials serves as an eye opener to teachers and promotes their better planning and scheduling.

In the view of Maulana et al. (2023) the use of instructional aids in teaching, boosts students' desire to study and as well enhance the understanding of the learner. Ajoke (2017) acknowledged that instructional materials aid teachers in explaining and making the learning of subject matter understandable to students during teaching and learning process. It gives the teacher enough guidance, co-ordination, supervision and more time for correction. Instructional materials also brighten the classroom, bring variety in the class lesson and are very effective in establishing sense or spirit of team work among learners. Osuala (2010) in his own contribution said it does not only help to motivate and develop interest on the part of the student, but also help to bring about an enhance respect for teachers knowledge of the subject.

However, Raiyegbemi et al. (2020) observed that one of the courses of failure in Nigerian secondary schools is inadequate school resources. They further explained that it cannot be over-emphasized that the provision of adequate school resources is a prerequisite for adequate performance in schools. Most of our

schools lack necessary infrastructural facilities required for effective learning. It can be agreed that for effective learning to take place, a student needs to be properly guided by the teacher by way of employing various methods and means through which learning could be meaningful to the student.

It is however noticed regrettably, that in the Nigeria system of education, little or no instructional material is made available. In rare cases when they are available, they are not accessible to best achieve the most desired goal of the teacher which has to do with the academic achievement of the learner at any point in time. This noticeable problem to the best of the knowledge of the researchers has not been properly researched especially in Orumba North Local Government Area of Anambra State, hence the decision of the researchers to embark on the current study.

### **Statement of the Problem**

Despite of the importance of instructional material to academic performance of students, it has been observed that most students complain of being taught principles that seem to be abstract in nature. The great problem and question in Nigeria Educational System is; to what extent are instructional materials made available? In cases where they are available, are there sufficient and accessible? Report has proved severally from the results of West African Examinations Council (WAEC) and National Examinations Council (NECO) on high rate of failure of students especially in Biology. This issue ought to be empirically investigated than speculated upon hence, the need for the present survey on availability and accessibility of instructional materials in teaching and learning of biology in senior secondary schools in Orumba North Local Government Area of Anambra State. The problem of this study put in question form is: What extent are the instructional materials available for use? What extent are the instructional materials accessible?

### **Research Questions**

The following research questions guided the study.

1. To what extent are instructional materials made available to biology teachers in Secondary Schools in Orumba North Local Government Area of Anambra State?
2. To what extent do teachers have access to instructional materials in teaching of biology in secondary schools within Orumba North Local Government Area of Anambra State?

### **Methodology**

Descriptive survey research design was used in the study. This was used since a group of people have to be studied systematically by collecting and analyzing their data. This study was carried out in all the public secondary schools within Orumba North Local Government Area of Anambra State. The population of the study consisted of the entire 13 principals and 25 biology teachers within the 13 public secondary schools in Orumba North Local Government Area of Anambra State. The estimated population of the principals and biology teachers in the study area was 38. The entire 13 principals and 25 biology teachers were used in the study, which makes the total of 38 as research respondents. Therefore, there was no sampling. The instruments used for data collection were a structured questionnaire and a checklist. The instruments were face and content validated by two experts in test and measurement and one specialist in science education department of Chukwuemeka Odumegwu Ojukwu University. In testing for the reliability, Cronbach's alpha ( $\alpha$ ) was used. The scores were used to calculate the variance. The coefficient of reliability was 0.88. This was used in order to determine the internal consistency of the instrument. The instruments were collected from the respondents by the researchers. Data collected in the study were analyzed with frequency percentage.

**Results**

Results are presented according to the various research questions.

**Research Question 1**

To what extent are instructional materials made available to Biology teachers in Secondary School within Orumba North Local Government Area of Anambra State?

**Table 1:** Frequency percentage on the extent of instructional materials made available to Biology teachers in Orumba North Local Government Area of Anambra State.

S/N	Items	Available		F	Not available %
		F	%		
1	Microscope	23	60.5	15	39.5
2	Magnetic compass needle	6	15.8	32	84.2
3	Preserved plant and animal specimen	24	63.2	14	36.8
4	Skeletal model of animal bone	9	23.7	29	76.3
5	Live insects and arachnids	30	78.9	8	21.1
6	Aquarium	3	7.8	35	92.1
7	Samples of different types of soil	32	84.2	6	15.8
8	Potted plants	12	31.6	26	64.4
9	Experimental chemicals	8	21.1	30	78.9
10	Refrigerator	2	5.3	36	94.7
11	Bunsen burner	22	57.9	16	42.1
12	Prepared slides	2	5.3	36	94.7
13	Test tube	28	73.7	10	26.3
14	Conical flasks	21	60.5	17	44.7
15	Measuring cylinder	24	63.2	14	36.8
16	Thermometer	26	68.4	12	31.6
17	Hand lens	23	60.5	15	39.5
18	Indicator	21	55.3	17	44.7
19	Computer	1	2.6	37	97.4
20	Projector	0	0	38	100

Data in table 1 shows that high frequency percentage were obtained for eleven out of the twenty listed items that direct on the availability of instructional materials for teaching and learning of biology in the public secondary schools within Orumba North Local Government Area.

Specifically, items 1, 3, 5, 7, 11, 13, 14, 15, 16, 17 and 18 had frequency percentage of 60.5, 63.2, 78.9, 84.2, 57.9, 73.7, 60.5, 63.2, 68.4, 60.5 and 55.3 respectively. The values were up to the average and above which was interpreted as agreed and therefore indicate that microscope, preserved plant and animal specimen, live insect and arachnids, samples of different types of soil, Bunsen burner, test tubes, conical flask, measuring cylinder, thermometer, hand lens and indicators, and the available instructional material. On the other hand, high frequency percentage of 84.2, 76.3, 92.1, 64.4 78.9, 94.7, 94.7, 97.4, and 100 were obtained for items 2, 4, 6, 8, 9, 10, 12, 19 and 20 respectively. The values indicates that magnetic compass needle, skeletal models of animal bone, aquarium, potted plants, experimental chemicals, refrigerator, prepared slides, computer and projector are not available.

**Research Question 2**

To what extent do teachers have access to the instructional materials in teaching of biology in secondary schools within Orumba North Local Government Area of Anambra State?

**Table 2: Frequency percentages on the extent teachers have access to the instructional materials in teaching of biology in secondary schools within Orumba North Local Government Area of Anambra State.**

S/N	Items	Available		F	Not available %
		F	%		
1	Microscope	14	36.8	24	63.2
2	Magnetic compass needle	5	13.2	33	86.8
3	Preserved plant and animal specimen	24	63.2	14	36.8
4	Skeletal model of animal bone	7	18.4	31	81.6
5	Live insects and arachnids	36	94.7	2	5.3
6	Aquarium	3	7.9	35	92.1
7	Samples of different types of soil	28	73.7	10	26.3
8	Potted plants	23	60.5	15	39.5
9	Experimental chemicals	3	7.9	35	92.1
10	Refrigerator	0	0	38	100
11	Bunsen burner	26	68.4	12	31.6
12	Prepared slides	15	39.5	23	60.53
13	Test tube	30	78.9	8	21.1
14	Conical flasks	29	76.3	9	23.7
15	Measuring cylinder	24	63.2	14	36.8
16	Thermometer	11	28.9	27	71.1
17	Hand lens	20	52.6	18	47.4
18	Indicator	28	73.7	10	26.3
19	Computer	1	2.6	37	97.4
20	Projector	0	0	38	100

Data in table 2 shows that high frequency percentage were obtained for ten out of the twenty listed items that direct on the teachers' access to instructional materials in teaching of biology in the public secondary schools within Orumba North Local Government Area of Anambra State.

Specifically, items 3, 5, 7, 8, 11, 13, 14, 15, 17 and 18 had frequency percentage of 63.2, 94.7, 73.7, 60.5, 68.4, 78.9, 76.3, 63.2, 52.6 and 73.7 respectively. The values were up to the average and above which was interpreted as agreed, and animal specimens, live insects and arachnids, samples of different types of soil, potted plant, Bunsen burner, text tubes, conical flask, measuring cylinder, hand lens and indicator are the accessible instructional materials.

On the other hand, high frequency percentage of 63.2, 86.8, 81.6, 92.1, 92.1, 100, 60.53, 71.1, 97.4 and 100 were obtained for items 1, 2, 4, 6, 9, 10, 12, 16, 19 and 20 respectively. The values indicate that microscope, magnetic compass needle, skeletal modes of animal bone, aquarium experimental chemicals, refrigerator, prepared slide, thermometer, computer and projector are not accessible.

### Discussion

This study examined the availability and accessibility of instructional material in teaching and learning of biology in Orumba North Local Government Area of Anambra State. Findings from this study showed that few instructional materials were available, such as microscopes, preserved animals and plant specimens, test tubes, indicators etc. This makes it difficult for students to identify them especially during external examination, hence the poor performance in biology. Bukayo (2019) submitted that instructional materials are not always available to teachers which they can use to teach students for better understanding in secondary schools. The low or poor availability of Instructional materials creates room for abstract lesson rather than concrete lesson in biology.

**Research question 2:** indicates the extent the teachers have access to the instructional materials in teaching of biology in secondary school. The results showed that teachers' access to instructional materials is not adequate. It is true that the available instruction materials are not sufficient, yet, teachers do not have full access to some of the available ones. For instance, microscopes and thermometers are available but not accessible by teachers. Poor maintenance, and inadequate time assigned for biology lessons, can deny biology teachers access to instructional materials. This will negatively affect the academic performance of biology students. It is because of this that Ikediashi (2002) pointed out that poor teaching experience, inadequate or poor physical infrastructure, unsatisfactory building design are likely to cause some physical discomfort for the students and are therefore bound to influence their academic achievement.

### **Conclusion**

Findings from this study showed that the availability of instructional materials in these schools is poor, including the most important ones. It also revealed that Biology teachers do not have access to available instructional materials.

### **Recommendations**

The following recommendations were made in line with the results of the study:

- The government/ministry of education should provide more adequate qualified biology teachers to all the public secondary schools in Orumba North Local Government Area of Anambra State.
- Biology teachers in public secondary schools in Orumba North Local Government Area should be sponsored to attend workshops where they will be taught how to improve and upgrade their competency in improvisation and utilization of Biology instructional materials. Such workshops could be held by the state government in collaboration with the state branch of Science Teachers Association of Nigeria tytgbv (STAN).
- The government should provide fund for schools so as to enable them procure the relevant resources for effective teaching and learning of biology.

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