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Availability and Utilization of Instructional Materials in Teaching and Learning of Basic Science in Secondary Schools in Owerri Municipal Council, Imo State, Nigeria

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Abstract

This study was conducted to assess the utilization of instructional materials in teaching and learning of basic science in secondary schools in Owerri Municipal Council. The study employed a descriptive survey design to determine the utilization of instructional materials in the teaching and learning of basic science in secondary schools in Owerri Municipal Council, Imo State, Nigeria. Two hundred (200) respondents comprising teachers and students from seven (7) public secondary schools in the council were interviewed using a modified five-point Likert instrument (questionnaire). The data collected were coded into SPSS and analyzed with descriptive statistics. The results showed that 95 persons reported they were provided with background information on the subject matter, 111 persons reported that instructional materials are used by teachers to develop lesson plan, 115 persons strongly agreed that chalk or marker boards is one of the types of instructional materials used in the teaching and learning of basic science in secondary school. Also, 89 persons strongly agreed that instructional materials are not usually available for basic science teachers to use. The results showed that the cluster mean in each research questions were above 2.5 as stated standards and it shows statistical significance. Then, lack of instructional materials/ facilities and non-utilization were among the major causes of poor performance of students in basic science in Owerri Municipal Council. In conclusion, the basic science teachers, school administrators and government in general were all aware of the problems of instructional materials in teaching and learning of basic science and they equally knew the strategies that will enhance the availability and utilization of such instructional materials in order to achieve production of resourceful teachers. Therefore, Government and schools authorities should help to provide instructional materials such as relevant and modern textbooks, charts, posters, computers, and so because basic science in secondary schools cannot be adequate learned without instructional materials.

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I. Introduction

Science education is the mainspring of any nation and remained a big industry in every developing country like Nigeria. The development of any country depends on the quality of her science education, which

also depends among other factors on the professional qualification and occupational competence of the teachers. Science education is a vital tool for the integration of an individual into the larger society so that they can achieve self-realization, develop national consciousness, promote unity and strive for socio-economic, political, scientific, cultural and technological progress [1].

Nigeria's aspiration as a developing country is for a positive advancement in science and technology. It is believed that such advancement will help a country like Nigeria to compete favorably with the so-called advanced countries of the world. this positive advancement in science and technology cannot be achieved without effective and efficient basic science education; hence the importance of basic science education in science and technology cannot be over stressed.

Basic science education is so important that every child must study it throughout the nine-year basic education period [2]. It is also needed by those who will study natural science subjects in the senior secondary schools as a foundation for the pursuit of life careers in natural sciences, health/medical sciences, technological and engineering-related fields. With all the importance of basic science in the Nigerian educational system, for many years basic science has witnessed a flood of persistent high failure rate in public examinations. This unpleasant situation have given both the Nigerian government and well-meaning citizens a source of concern. Various examination analyses have tried to identify factors which could contribute to the observed poor performance. Indeed, the general consensus using Federal Ministry of Education report of 2010 is that the poor performance in basic science resulted from remarkable lack of well organized human resources, instructional materials and facilities in teaching and learning of basic science at the junior secondary education level [3].

For effective teaching/learning of any subjects more especially those requiring theoretical and practical dimensions like basic science, certain materials are required; such materials are referred to as instructional materials. Instructional materials represent all the alternative channels of communication which teachers can use to compress and represent materials in a more vivid form to the subjects. According to Dike [4], instructional materials are set of materials which classroom teacher can use to extend the range of vicarious experiences to his learners, hence, instructional materials will enable the learners argue the learning process by providing extended experiences.

Instructional materials can be classified into two board categories, namely standard and locally produced instructional materials. The standard materials refer to conventional or sophisticated materials and equipment manufactured or produced by a recognized company or organization, while the locally produced instructional materials refer to materials produced and utilized by teachers using alternative material resources to facilitate effective teaching and learning, [5]

In line with the above statement, instructional material can actively used to facilitate the teaching and learning process in most of the developed countries. However, the situation is not good in most of the developing countries, such as Nigeria. In the first instance, only the lower quality and the less quantity of instructional materials are provided to schools in terms of availability of the instructional material. The second example, teachers are not properly trained in use of instructional materials. Lastly (thirdly), teachers do develop poor interest in use of instructional materials. The government is spending a huge amount of money in the educational sector, however, the quality of education is very low. There are a lot of factors that can be attributed to low quality of education. Less availability and deficient use of instructional materials is one of them, therefore the researcher observed that instructional materials for basic science teaching are unavailability, costly and out of reach for many secondary schools more especially at the rural areas and even the ones available cannot be used by the teachers due to so many other factors. Therefore, it is necessary to determine the utilization of the instructional materials in teaching and learning of basic science at the junior secondary school level are faced with a lot of problems which require urgent attention.

II. Materials and Methods

The study employed a descriptive survey design to determine the utilization of instructional materials in the teaching and learning of basic science in secondary schools in Owerri Municipal Council, Imo State, Nigeria.

The area of study was Owerri Municipal Council which is the capital city of Imo State, Nigeria. It is one of the 27 local government areas of Imo state, located on the South-Eastern part of Nigeria. Majority of the residents were from Igbo ethnic group. Owerri Municipal Council is located approximately between latitudes 6^0 $.21^1$and 60.31^1 N, and longitude 7^0 and 7^0 05E of the equator. She is traditional called "Owere Nchi Ise", which implies that Owerri Municipal Council is made up of five communities; Umuororonjo, Amaawom, Umuonyeche, Umuodu and Umuoyima in order of seniority.

Owerri Municipal Council has a land mass of 24.88km2 with a plain terrain of $19.14Km^2$ and wet land of $5.47Km^2$. She is bounded on the North by Amakohia, on the North east by Uratta, on the East by Egbu, on the South-East by Naze, on the South by Nekede and on the North-West by Irete. The vegetation is tropical

rain forest although some parts consist of Guinea Savanna forest. The mean annual rainfall is the council is between 2,250mm and 2,500mm, while the mean annual temperature is 25^{o}c to 27^{o}c. the relative humidity is around 80%.

Owerri Municipal Council was created by the then military Head of State, Late Gen. Sami Abacha on 26th August, 1996. According to Nigerian 2006 census figure, Owerri Municipal Council has a total population of 127, 213 with 62,990 males and 63,223 females. She has about 17,000 households with offices and shops [6]. The population of the study consists of all the staff and students of the public secondary schools in Owerri Municipal Council Imo State, Nigeria. The schools and their respective populations are listed below:

S/N	Item Statements	Teachers	Students
1	Boys' Model Secondary School, New Owerri	90	1,366
2	Comprehensive Development Secondary School, Owerri	103	3,377
3	Emmanuel College, Owerri	74	1,183
4	Government Secondary School Owerri	130	3,673
5	Government Technical College, Owerri	117	1,994
6	Ikenegbu Girls' Secondary School, owerri	133	4,109
7	Urban Development Secondary school, Owerri	81	1,849
	Total	743	17,551

Source: Secondary Education Management Board (2018/2019)

According to Rastogi [7], Akinsolu [8], and Banerjee and Morella [9], reported that the component secondary schools of the study area are known and listed, cluster sampling techniques was employed. Ten (10) respondents basic science teachers were randomly selected from each of the seven secondary schools studied. Similarly, 10% of students' populations were randomly selected from each secondary school studied. The table below shows the sampled population:

S/N	Item Statements	Teachers	Students
1	Boys' Model Secondary School, New Owerri	10	14
2	Comprehensive Development Secondary School, Owerri		33
3	Emmanuel College, Owerri	10	11
4	Government Secondary School Owerri	10	36
5	Government Technical College, Owerri	10	16
6	Ikenegbu Girls' Secondary School, owerri	10	11
7	Urban Development Secondary school, Owerri	10	9
	Total	70	130

The instrument used for data collection was questionnaire and it consists of questions on modified four (4) point liket type scales of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). A correlation of 0.95 was gotten using a person Moment Correlation which indicated that the instrument was 95% reliable. A total of two hundred (200) copies were distributed accordingly. The respondents filled the questionnaire and they were collected on the spot by the researcher to avoid loss on transit, and also to ensure that selected respondents were responsible for the data. Data collected were coded into SPSS and analyzed with descriptive statistics.

III. Results

The result in table 1 showed the importance of instructional materials in the teaching and learning of basic science in secondary schools; majority (95) persons strongly agreed that instructional materials provides background information on the subject on the subject matter, 75 persons agreed, 20 persons disagreed and 10 strongly disagreed. Instructional materials are used by teachers to develop lesson plan; 111 persons strongly agreed, 83 agreed, 6 disagreed. The instructional materials help the teachers to assess the knowledge of their students; 65 persons strongly agreed, 105 agreed, 20 disagreed and 13 strongly disagreed. Instructional materials offer the teachers some insights into the best methods of creating exams; 115 persons strongly agreed, 55 agreed, 12 disagreed and 10 strongly disagreed. Instructional materials provide innovation and creative ways to assess students performance; 115 strongly agreed, 76 agreed, 9 strongly disagreed and no person on disagreed. The item statements are statistically significant as their means scores were above 2.5 and also supported by the cluster mean 3.3. This means that the importance of instructional materials in the teaching and learning of basic science in secondary schools.

Table 1: Importance of instructional materials in the teaching and learning of basic science in secondary schools

S/N	Item of Statement	SA	A	D	SD	N	$\bar{X}$
1	It provides background information on the subject matter	95	75	20	10	200	3.3
2	Instructional materials are used by teachers to develop lesson plan	111	83	6	-	200	3.5
3	Instructional materials help the teachers to assess the knowledge of their students	65	105	20	13	200	3.1
4	Instructional materials offer the teachers some insights into the best methods of creating exams	115	53	12	10	200	3.3
5	Instructional materials provide innovation and creative ways to assess students performance	115	76	-	9	200	3.5
	Cluster mean						**3.3**

The result in table 2 showed the types of instructional materials used in the teaching and learning of basic science is secondary school; 115 persons strongly agreed that chalk or marker boards are one of the types of instructional materials used in the teaching and learning of basic science, 48 persons agreed, 19 persons disagreed and 18 strongly disagreed. Supplemental print materials are one of type of instructional materials used in the teaching and learning of basic science; 93 persons strongly agreed, 101 agreed, nobody disagreed and 6 persons strongly disagreed. Projected materials; 40 persons strongly agreed, 153 agreed, 5 disagreed and 2 strongly disagreed. Computer-based programs; 49 persons strongly agreed, 86 agreed, 15 disagreed and 50 strongly disagreed. Models, mock-ups or cut-away; 50 strongly agreed, 36 agreed, 85 disagreed and 29 strongly disagreed. The item statements are statistically significant as their means scores were above 2.5 and also supported by the cluster mean 3.0. This means that the types of instructional materials used in the teaching and learning of basic science is secondary school.

Table 2: Types of Instructional Materials used in the Teaching and Learning of Basic Science is Secondary School

S/N	Item Statements	SA	A	D	SD	EFX	N	$\bar{X}$
1	Chalk or marker boards	115	48	19	18	685	200	
2	Supplemental print materials	93	101	-	6	681	200	3.4
3	Projected materials	40	153	5	2	531	200	3.2
4	Computer-based programs	49	86	15	50	534	200	2.7
5	Models, mock-ups or cut-away	50	36	85	29	478	20	2.5
	Cluster mean							**3.0**

The table 3 showed the problems that are associated with the availability and utilization of instructional materials in the teaching and learning of basic science in secondary schools; 89 persons strongly agreed that instructional materials are not usually available for basic science teachers to use, 82 persons agreed, 23 persons disagreed and 6 strongly disagreed. Time allocated to the teaching of basic science does not favour the use of instructional materials; 91 persons strongly agreed, 86 agreed, 14 persons disagreed and 9 persons strongly disagreed. Basic science teachers lack skills to used instructional materials; 56 persons strongly agreed, 64 agreed, 48 disagreed and 32 strongly disagreed. Lack of facilities like basic science laboratory hinders the use of instructional materials; 43 persons strongly agreed, 101 agreed, 52 disagreed and 4 strongly disagreed. Inability to appreciate the need for using instructional materials by basic science teachers; 131 strongly agreed, 49 agreed, nobody disagreed and 20 strongly disagreed. The item statements are statistically significant as their means scores were above 2.5 and also supported by the cluster mean 3.2. This means that the problems that are associated with the availability and utilization of instructional materials in the teaching and learning of basic science in secondary schools.

Table 3: Problems that are Associated with the Availability and Utilization of Instructional Materials in the Teaching and Learning of Basic Science in Secondary Schools

S/N	Item Statements	SA	A	D	SD	EFX	N	$\bar{X}$
1	Instructional materials are not usually available for basic science teachers to use	89	82	23	6	654	200	3.3
2	Time allocated to the teaching of basic science does not favour the use of instructional materials	91	86	14	9	659	200	3.3
3	Basic science teachers lack skills to used instructional materials.	56	64	48	32	544	200	2.7
4	Lack of facilities like basic science laboratory hinders	43	101	52	4	583	200	3.0

	the use of instructional materials							
5	Inability to appreciate the need for using instructional materials by basic science teachers	131	49	-	20	691	200	3.5
	Cluster mean							**3.2**

IV. Discussion

The findings of this research reveals the importance of instructional materials in the teaching and learning of basic science in secondary schools which focused on instructional materials are used to develop lesson plan, to assess the knowledge of their students, to offer the teachers some insight into the methods of creating examinations and to provide innovative and creative ways to assess students' performance. The means cores of item statements were rated statistically significant as they were above the expected mean of 2.5 as well as the cluster mean which was 3.3. This implies that utilization of instructional materials in the teaching and learning of basic science in secondary schools are of great importance to both the teacher and their students. The above explanation was supported by Dahar [10], who stated that instructional materials are highly important for teaching, especially for inexperienced teachers.

Based on the analysis of the study, there was statistical difference between the variables since the expected mean value of 2.5 was less than the cluster mean value of 3.0 and it implies that there are specific types of instructional materials designed for the teaching and learning of basic science in secondary schools.

The result of this research also revealed that instructional materials are not usually available for basic science teachers to use, time allocated to the teaching of basic science does not favour the use of instructional materials, teachers lacks skills to use instructional materials during teaching, lack of facilities like basic science laboratory hinders the use of instructional materials, and inability to appreciate the need for using instructional materials by basic science teachers are the problems that are associated with the utilization of instructional materials by the basic science of teacher in secondary schools in Owerri Municipal Council.

The findings agreed with Abubakar [11] and Abimbade [12] who observed that problems associated with the availability and utilization of instructional materials among basic science teachers were non availability, unfavorable time allocation, lack of skills, lack of facilities like basic science laboratory and inability to appreciate the need for using instructional materials by the basic science teachers.

Looking at the strategies to be used to enhance basic science teacher's utilization of instructional materials in the teaching and learning of basic Science in Secondary Schools focused on availability of instructional materials, establishment of instructional materials centres and laboratory, employment of professional trained basic science teachers by Government. Yusuf [13] opined that there are strategies which can be utilized to enhance the availability and utilization of instructional materials among basic science teachers and other teachers in teaching and learning of basic science, in secondary schools.

Education is the driving force of any nation and has remained for sometimes a big industry in Nigeria and this can only be successfully achieved if teachers who are considered as builders of individuals can handle their teaching profession as their own personal business. And follow the step-by-step procedures during teaching process which entails understanding the basic science subject they handle and the type of instructional materials that can be used to explain it in a simplest form to the student during the course of teaching and learning process.

V. Conclusion

From the findings of this study, the utilization of instructional materials in the teaching and learning of basic science in secondary schools in Owerri Municipal Council, Imo State, Nigeria were made available and continuous/proper utilization by the basic science teachers enhanced effective and efficient teaching and learning of basic science. The basic science teachers, school administrators and government in general were all aware of the problems of instructional materials in teaching and learning of basic science and they equally knew the strategies that will enhance the availability and utilization of such instructional materials in order to achieve production of resourceful teachers.

VI. Recommendations

In line with the findings of the study, the following recommendations were made;

i. Government and schools authorities should help to provide instructional materials such as relevant and modern textbooks, charts, posters, computers, and so because basic science in secondary schools cannot be adequate learned without instructional materials.
ii. Parent-Teacher Association (PTA) of every secondary school should help to provide the students with other relevant instructional facilities like basic science laboratory.
iii. Government at all levels should also at intervals of time, organize seminars, workshops and in service training for basic science teachers to up-date their knowledge and skills on the use of modern instructional materials.

iv. Government should subsidize the prices of instructional materials.

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