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Availability of Facilities and Utilization of Instructional Procedures for Implementation of Chemistry Core Curriculum in Senior Secondary Schools in Ebonyi State

Anugwo Margaret N; Nworie Theophilus J; Irene Egbe O; Enyi Paul O; Okpube Michael N.
Department of Science Education, Ebonyi State University, Abakaliki.
Corresponding Author:megito218@gmail.com

Abstract

This study investigated availability of teaching facilities and utilization of instructional procedures for implementation of Chemistry core curriculum (CCC) in senior secondary schools (SSS) in Ebonyi State. Specifically,it determined level of availability of stipulated facilities and extent of utilization of instructional procedures by teachers for implementation of CCC in SSS in Ebonyi State. Design of the study was descriptive survey. Population was made up of all 216 senior secondary schools in Ebonyi State. Proportionate random sampling was used to draw a sample of 120 schools. Chemistry teachers and laboratory attendants participated in the study. Instruments for data collection were checklist and questionnaire. Results show that good examination halls, chalk board and classrooms were 100% very highly available, standard Chemistry laboratory(16%), projector(16%), chemicals and reagents(14%), water and electricity(33% each) were lowly available. Utilization of lecture and laboratory instructional procedures (IP) was of a very high extent with a mean of 3.78 and 3.70 respectively, activity based IP 2.98 and project IP has a mean of 2.73. Analogy and programmed IPs were very lowly utilized with a mean of 1.20 and 1.08 respectively. The study recommended among others, that government should make available teaching and learning facilities as stipulated in CCC to secondary schools for better achievement and implementation of the curriculum.

Keywords: Curriculum, Chemistry, Implementation, Availability, Utilization, Facilities, Instructional, Procedures.

Introduction

Chemistry is one of the science subjects offered in the Senior Secondary Schools (SSS) in Nigeria. It has beendefined as the study of matter and its interaction with other matter and energy (Helmenstine 2020). There are organic, inorganic, physical, analytical, industrial biochemistry. It has grown from the areas of polymer, environmental and medicinal to pesticide, forensic,computer Chemistry among others. These are important areas and aspects of life. Chemistry is a central subject required at Senior Secondary School Certificate (SSSC) level for entry into nearly all basic and applied science courses at the tertiary level of education in Nigeria, hence the serious concern for appropriate implementation of the SSS Chemistry Core Curriculum (CCC). Curriculum is

a planned sequence of learning experiences, mapped out for students to enable them achieve proficiency in knowledge, values and skills. It determines what is taught by teachers, learned by students and how these are achieved. Mulenga (2019) defined curriculum as embodying the intentions of education. It carries the beliefs, values, attitudes, skills, knowledge and all that education is about. Selvan (2021) observed thatcurriculum is the heart of education. It is the plan or a blueprint of everything that is supposed to happen inside the school. The State of Rhodes Island (2023), opined that the structure, organization and considerations in a curriculum are created in order to enhance learning and facilitate instruction. Like other SSS subjects, CCC according to Federal Ministry of Education (2007) is structured as a 3-year program for Senior Secondary School Students (SSSS). CCC stipulates the goals and objectives of Chemistry education. It also contains the content areas taught to all SSS students, the instructional material used in teaching the contents, the expected ratio of teacher to students in the class, the facilities, instructional procedures for teaching Chemistry and the assessment tools for evaluating students' outcomes. On facilities, a lot of them were listed in the CCC to be made available for the learning of Chemistry in every school in Nigeria. They are: standard and well equipped laboratories with preparatory rooms, chemicals and reagents, well equipped library, regular running taps and electricity supply, among other things. The Instructional procedures stipulated are: activity based, concept mapping, inquiry, laboratory teaching, Simulation and games among many others listed in the result of this study. The CCC focused on practical activities with emphasis on locally available materials for its effective implementation.

Curriculum implementation according to Selvan (2021) is the act of working out the plans and suggestions that have been made by curriculum specialists and subject experts in a classroom or school setting. Selvan opined that teachers are the main implementers of the curriculum There can never be proper implementation of curriculum without due consideration to the learners; how they acquire the skills stated in the objectives, the extent of acquisition, the environment in terms of availability of facilities for learning and the qualified teachers to implement the program and utilization of the right teaching methods by teachers. Appropriate teaching method brings instruction to real life experience while encouraging students to actively engage with content and develop their knowledge and skills. On curriculum implementation in Ebonyi State, Anugwo et al (2023), reported that public school pupils and their parents are bearing the brunt of deplorable classrooms and a shortage of teachers as the state government neglects basic education. Most of the schools in Ebonyi State are reported to be overcrowded, have leaking roofs, dilapidated libraries, toilets and absence of seats and desks for pupils. These reports however need to be verified. Still on the implementation of the Core Curriculum (CC) in Ebonyi State Secondary Schools, Nwakpa (2010) earlier in his study found that

there was inadequate provision of human and material resources, no fire extinguisher and gross inadequate provision of toilet facilities in the schools. Nwakpa reported that while Government recommended one toilet to 40 students (1:40), many schools do not have adequate number of toilets. Teachers occupy uncomfortable offices and in a deplorable condition. The report also noted that Ebonyi State secondary schools have good libraries and classrooms, but the classrooms are overcrowded and there are not enough qualified teachers. These situations caused poor academic achievement of students in public examinations (Nwakpa 2010). Also the study of Anugwo, et al (2022) on the level of implementation of CCC in Ebonyi State reported that although the schools teach approved contents, they made very low use of instructional materials and evaluation procedures by teachers, with reference to the CCC.

Availability and utilization of facilities in schools are so important in teaching and learning as they assist teachers in effective delivery of lessons to the students. Babalola (2023) opined that quality education requires quality infrastructure, excellent and well remunerated teachers and planning, among other things. Bediako (2019) also observed that when facilities are not provided, it implementation of the curriculum is hinderer. The West African Examination Council's Chief Examiners' Report (2022) attested to the poor achievement of students in Chemistry over the years. According to Nbina (2012), the widespread of poor performance and the negative attitude in Chemistry by SSSS have been largely ascribed to teaching problems.

Curriculum implementation requires teachers to feel confident in the delivery procedures and materials they use (Nevenglosky, et al 2019). Aung & Khaing (2016),observed that the salient challenges on implementation of curriculum in the developing countries including Nigeria include the lack of relevant curriculum, lack of infrastructure, lack of ICT knowledge, weakness of content development, educators, among other things. The extent to which poor performance of students in Chemistry in Ebonyi state is attributable to the level of implementation of the curriculum remains questionable. This is a gap this study intends to fill.

Purpose of the Study

The general purpose of this study was to investigate the availability of teaching facilities and utilization of instructional procedures for implementation of Chemistry Core Curriculum (CCC) in senior secondary schools (SSS) in Ebonyi State of Nigeria. Specifically, the study determined:

1. level of availability of stipulated facilities for implementation of CCC in SSS
2. extent of utilization of stipulated instructional procedures for implementation of CCC in SSS in Ebonyi State.

Research Questions: The following research questions guided the study:

1. What is the level of availability of stipulated facilities for implementation of CCC in SSS in Ebonyi State.

2. To what extent are stipulated instructional procedures utilized by Chemistry teachers for the implementation of CCC in SSS in Ebonyi State.

Methodology

***Design of the Study*:** The design of the study was the descriptive survey research design.

***Area of the Study*:** The study was conducted in Ebonyi State of Nigeria. It has three education Zones and 216 senior secondary schools. (Secondary Education Board Abakaliki 2023/2024Academic Session). Ebonyi State is generally regarded as an educationally disadvantaged State.

***Population of the Study*:** The population of the study was all the 216 senior secondary schools (SSS) in Ebonyi State, distributed in the three education zones as follows: Abakaliki-68, Afikpo- 82 and Onueke-66. All the 124 Chemistry teachers (103 males and 21 females) and 228 laboratory attendants (107 males and 121 females) in the 216 secondary schools were all part of the implementation process in each school and were used in the study.

***Sample of the Study*:** The sample was 120 schools, stratified according to the three education zones in the state through proportionate random sampling; 37 schools were drawn from Abakaliki, Onueke 36 and Afikpo 45. Only schools that have laboratories and laboratory attendants were purposively sampled for the study. A total of 120 lab attendants and 120 Chemistry teachers in the sampled schools were used for the study.

***Instrument for Data Collection*:** The instruments for data collection were a checklist and a questionnaire developed from the Chemistry core curriculum (CCC).Section A of the checklist contained the name of school, gender and education zone. Section B has the list of all the instructional facilities stipulated in the CCC. The checklist focused on facilities available for implementation of the CCC in each school and also the number of students in each school. The 4-point scale questionnaire focused on 20 instructional procedures used in teaching Chemistry as stipulated in CCC. It had response options of: Very Often Used, Often Used, Rarely Used and Not Used At All.

The instruments were validated by three experts in relevant fields. It was trial tested in secondary schools in the neighboring Enugu State for reliability. Cronbach Alpha estimate of reliability was used to calculate the internal consistency of 0.78. Both the extent of availability of facilities and utilization of instructional procedures were later classified under the decision rule as: Very High level, High Level, Low Level and Very Low Level.

***Data Collection Methods*:** The checklist was used in the 120 schools sampled for the study by the researchers to collect data on facilities, with the help of laboratory assistants. On the extent of utilization, the researchers developed a scoring guide using the questionnaire with options: Very Often Used, Often Used, Rarely Used and Not Used At All. The Laboratory attendants were trained by the researchers on how to observe the Chemistry teachers when teaching the students. They rated their observations based on the number of times the Chemistry teachers used any

of the instructional procedures listed in the questionnaire. Teachers did not rate themselves to avoid all forms of bias emanating from them (like highly rating themselves even when they are far from being perfect). The observation lasted for a whole school term.

***Data Analysis Techniques*:** Percentage was used to analyze data on facilities.Facilities with percentage score of 70 percent and above wereregarded as "very high level" (VHL) of availability; 50 percent – 69 percent = "high level" (HL); score of 40 percent – 49 percent = "low level" (LL) and a score of 0 percent – 39 percent = "very low level" (VLL). The percentage scores were approximated to the nearest whole number.Mean ($\overline{X}$) and standard deviation were used to analyze data on teachers' utilization of instructional procedures."Very Often Used"(4);"Often Used" (3);"Rarely Used" (2); and "Not Used At All" (1). A mean score of 0 indicated Not Used at all (Decision Rule is Very Low Extent Utilization), 0.1 - 2.4 = Rarely Used (Low Extent Utilization), 2.5 – 3.4 = Often Used (High Extent Utilization) and 3.5 – 4.0 = Very Often Used (Very High Extent Utilization).

Results

Table 1: Percentage Rating on the Level of Availability of Stipulated Teaching Facilities for Implementation of Chemistry Core Curriculum in Senior Secondary Schools in Ebonyi State.

S/N	SFAC	SPSS	ANOF	NOSS	FASR	CCC&	D
1	Standard & well-equipped Chemistry laboratory	1:50	100	32100	1:321	16%	VLL
2	Standard preparatory room in Chemistry laboratory	1:1	45	120	1:3	33%	VLL
3	standard dark room in Chemistry laboratory	1:1	45	120	1:3	33%	VLL
4	Standard preparatory tables in Chemistry laboratory	2:1	90	120	2:3	33%	VLL
5	Chemistry laboratory store	1:1	45	120	1:3	33%	VLL
6	Appropriate chemicals and reagents for Chemistry practical in Chemistry laboratory	1:5	900	32100	1:36	14%	VLL
7	Well-equipped library with appropriate and recommended Chemistry texts.	1:1	90	120	1: 13	76%	VHL
8	Adequate and sizable examination hall.	1:1	120	120	1: 1	100%	VHL
9	Adequate classroom	1:50	650	32100	1:49.4	100%	VHL
10	Chalk Board	1:50	650	32100	1:49.4	100%	VHL
11	White board	1:50	650	32100	1:49.4	100%	VHL
12	Projector	1:50	100	32100	1:49.4	100%	VHL
13	Projector screen board	1:50	100	32100	1:321	16%	VLL

Table 1 continued

14	Constant water system in Chemistry laboratory	1:1	40	32100	1:321	16%	VLL
15	Constant electricity power supply in Chemistry laboratory	1:1	45	120	1: 3	33%	VLL
	Cluster52.13%	**Mean**				**Percentage**	**HL**

S/N = Serial Number. SFAC = Stipulated Facilities. SPSS = Specification Per School or students as the case may be. ANOF = Available Number of Facility. NOSS = Number of Students or Schools as the case may be. FASR = Facility Availability Stipulated Ratio. %CCC = Percentage Compliance to Chemistry Core Curriculum. D= Decision, VHL = Very High Level, HL = High Level, LL = Low Level, VLL = Very Low Level

Table 1 shows that in the schools, the stipulated facilities in items 1 - 6, 12, 13 and 15 have percentage ratings of 16 , 33, 33, 33, 33, 14, 16, 16 and 33, respectively, indicating very low level availability of the itemized facilities with the specification of Chemistry core curriculum. These facilities, though available in some schools, have low percentage compliance to the Chemistry Core Curriculum. The result also showed that the stipulated facilities in items 7 -11 with 76%, 100%, 100%, 100%, 100% respectively were available and had high percentage compliance to CCC. The cluster mean percentage of 52.13% in research question one indicated that the availability of the approved teaching facilities for the teaching of Chemistry in senior secondary schools in Ebonyi State is to a high level.

Table 2: Mean Response and Standard Deviation of Teachers' Utilization of Stipulated Instructional Procedures for the Implementation of Chemistry Core Curriculum

SN	Instructional Procedures	Mean	SD	Decision
1	Activity based teaching	2.98	0.57	HE
2	Concept mapping	1.43	0.56	VLE
3	Inquiry Teaching	2.52	0.50	HE
4	Laboratory Teaching	3.70	0.46	VHE
5	Analogy instructional Procedure	1.20	0.40	VLE
6	Programmed instructional Procedure	1.08	0.28	VLE
7	Team teaching	1.80	0.40	LE
8	Role playing instructional Procedure	1.05	0.22	VLE
9	Simulation and games	1.07	0.25	VLE
10	Guided discovery instructional Procedure	2.30	0.46	LE
11	Scaffolding teaching Procedure	2.52	0.50	HE
12	Cooperative teaching Procedure	2.07	0.31	LE
13	Excursion/ field trip teaching	1.67	0.48	LE
14	Lecture method of teaching	3.78	0.42	VHE
15	Project teaching Procedure	2.73	0.45	HE
16	Demonstration Teaching Procedure	3.92	0.28	VHE
17	Discovery Teaching Procedure	2.47	0.50	LE

Table 2 continued

18	Individualized Teaching Procedure	1.52	0.50	LE
19	Peer tutoring instructional Procedure	2.22	0.42	LE
20	Discussion Teaching Procedure	3.43	0.59	HE
Cluster Grand Mean		**2.273**		**LE**

SN = Serial Number. SD = Standard Deviation. VHE = Very High Extent, HE = High Extent, LE = Low Extent, VLE = Very Low Extent.

Table 2 shows that the extent of utilization of the stipulated instructional procedures by Chemistry teachers (as observed by the Lab Attendants) in the schools, for the implementation of the Chemistry core curriculum, is to a low extent. Items 1, 3, 11, 15 and 20 have mean ratings of 2.98, 2.52, 2.52, 2.73 and 3.43 respectively which indicate high extent utilization of these instructional procedures. Items 4, 14 and 16 have the mean ratings of 3.70, 3.78 and 3.92 respectively indicating a very high extent utilization of the itemized instructional procedures while items 2, 5 - 10, 12, 13, 17 - 19 have mean ratings of 1.43, 1.20, 1.08, 1.80, 1.05, 1.07, 2.30, 2.07, 1.67, 1.52 and 2.22 respectively for the listed instructional procedures and to a very low extent of utilization. The grand mean of 2.273 indicated a low percentage utilization of the stipulated instructional procedures in the senior secondary schools in Ebonyi State..

Discussion

The results of data analysis revealed the information from the schools on the availability of stipulated facilities and also the utilization of instructional procedures in the implementation of Chemistry core curriculum (CCC) in Ebonyi State Secondary schools. The result revealed that there is 52.13% CCC compliance of the available facilities. This means that there is high level availability of learning facilities in secondary schools for teaching and learning Chemistry. From the result, most schools have good examination halls because part of the implementation process requires the visitation of schools from the Ministry of Education team for the inspection of the examination halls. This is the main reason for 100% availability, indicating that every school has a good examination hall. They also have chalk and white boards for writing during teaching. They have libraries, running water in the laboratories. This is in agreement with Nwakpa (2010)'s study. They are good and enhance proper curriculum implementation. However, more facilities are needed for effective implementation of secondary school Chemistry core curriculum. Result showed that there is a very low level availability of standard and well equipped laboratory, chemicals and reagents for Chemistry practical and very low level availability of electricity supply in the schools studied. Bandao (2023) found the current status on the availability of facilities in the Junior High School of Zeneben (Philippines) Integrated School in the first semester of the school year 2022/2023. They found that the physical facilities are generally in good condition and their performance was found in totality to be very satisfactory. This means that

when infrastructural facilities are available in schools, achievements of students are enhanced. Afework and Asfaw (2014) also asserted that significant change in behavior among students cannot take place without the availability and proper use of school facilities and other needed resources. Also the findings of Olelewe & Nzeadibe (2015) in support of the result of the study said that, there was gross inadequacy of material resources in Nigerian secondary schools and this affected the quality of education given to pupils. Igwe (2015) also pointed out that public secondary schools have witnessed great decay in terms of facilities. To Igwe, most schools are a caricature of what schools should be in a modern state because of collapsed buildings, leaking roofs, unkempt surroundings, lack of public toilets, water supply and other facilities. Lack of these facilities will not perfect the implementation process it will rather enhance poor academic achievement. These are basic requirements for the effective implementation of the curriculum. Absence of these facilities is the cause of the poor achievement of Ebonyi State SS students in Chemistry as reported by the WAEC Chief Examiners' Report because availability of these facilities enhances achievement of students. As reported by Andrews (2019), the quality of school facilities affect students in two ways; firstly, a lack of facilities limits the ability of a student to achieve various learning and extra curricula activities. Secondly, a lack of facilities has a negative impact on a teachers' job satisfaction, which undermines their motivation to teach. Octavia, Ismiyati & Sholikan (2019), agreed that school facility is one of the factors supporting students' learning achievement and teacher performance. Therefore learning achievements and school quality can be improved through availability of school facilities.

The findings of research question 2 revealed that, there is low extent utilization of the specified instructional procedures in the secondary Chemistry core curriculum in Nigeria. The findings reported that teachers mostly use Lecture method of teaching in their day to day teaching of students, at the expense of other specified instructional procedures designed for each topic. Pooja (2017) opined that for effective teaching to take place, a good method must be adopted by the teacher. Pooja agreed that teachers often use techniques which take care of multiple learning styles.Also according to Sumera & Mustaq (2017), the recommended teaching procedures were based on curricular provision considering the learner, nature of topic, instructional objectives, instructional settingand resources available.The teaching of Chemistry as science subject requires the use of laboratory teaching and demonstration procedures, concept mapping, project methods and problem solving if the teachers should make meaningful impact in the teaching and learning process. However, the aforementioned teaching procedures were rarely employed by teachers in teaching and learning of Chemistry according to the result. The Chemistry teachers do not use the teaching procedures specified in the curriculum according to topic or content. For example: In Chemistry, topics that

involve collection of gases require laboratory and demonstration method of teaching but most teachers use lecture method. This could make the process unproductive in terms of objectives and goals achievements. According to School Dekho (2023), poor teaching can have a profound effect on a student's academic performance. For one, students who are exposed to poor teaching may not understand the subject matter; leading to lower grades and test scores. They may also lose interest in learning, become disengaged and eventually drop out of school. Khan & Soumya (2016), asserted that superior instructional procedures stimulate students to study and perform at least as expected, while poor teaching unmotivated them which catalyze the process of diminishing interest on the topic. Bilal, Nikulina &Gao (2023) informed that use of appropriate teaching method is important because they determine the practices, approaches and materials used by instructors. Utilization of adequate teaching methods in teaching is essential for effective language learning, students' motivation, quality assessment and personalized instruction. Teachers are therefore encouraged to maximize the teaching process by the use of good teaching methods.

Conclusion

Facilities for effective implementation of the Chemistry core curriculum in senior secondary schools in Ebonyi State are highly available except good preparatory laboratories, standard Chemistry preparatory stores, electricity supply, projector, chemicals and reagents that are of very low level of availability. Non availability of basic facilities for the implementation process affects teaching and learning. It should not be encouraged. Teachers utilize mostly lecture and laboratory methods at the expense of other teaching methods specified in the curriculum like project, problem solving, demonstration, concept mapping, etc. This will inhibit achievement. Hands-on and innovative instructional procedures like project, program instructional procedure, team teaching, cooperative teaching and excursions/field trips be used in teaching Chemistry. This will make the implementation process perfect and done with fidelity.

Recommendation

The following recommendations were made on this study:

1. Government should make all instructional facilities stipulated in the Chemistry Core curriculum available to secondary schools for effective implementation of the (CC).
2. Teachers should utilize instructional procedures like role playing. Simulation/games, scaffolding, guided discovery, peer tutoring, discussions and other learner friendly instructional procedures in teaching, instead of only the conventional methods.
3. Teachers should be exposed to the use of the right instructional procedures as stipulated in the CC for teaching chemistry, through seminars, workshops and other educational programs.

4. Government should not only design good curriculum but should ensure its effective implementation.
5. Governments are encouraged to use experts in evaluating the implementation of all education programs from time to time.

References

Afeworks, T. H. & Asfaw, M. B.(2014). The availability of School Facilities and their effects on the quality of education in government primary schools of Harari Regional State and East Hararghe Zone Ethiopia Middle Eastern and African journal research issues, 11 (1)

Andrews, A. (2019). *How School Facilities Improve a Child's School Experience*. Under Industry News

Anugwo, M.N., Nworie, T.J., Nnachi, N.O., Ugama, J. O., Egbe, I., Ikporo F. B. (2022). Level of implementation of the secondary school science core curriculum in Nigeria.*Journal of Entrepreneurship Education*. 26(1) 1-13.

Aung, T. N. & Khaing, S.S. (2016).*Challenges of implementing e-learning in developingcountries: A Review.* University of Technology (Yatanarpon Cyber City), Myanmar.Retrieved on 7/5/2023 from www.researchgate.net.

Ayodele, M.A. (2009). Teachers' perception on environtal education curriculum delivery in Nigeria: A case study of federal capital territory. 50th*Annual Conference Proceedings of Science Teachers Association of Nigeria.* 203 – 208.

Babalola, A.A. (2023) *Pathways to Sustainable Education in Nigeria* (3). Vanguard May 3, 2023.

Bandao, B.T. (2023). School support facilities, students' performance and participation in academic activities: A literature review. *International Journal of Research Publications*. 118 (1) 91 – 99.

Bediako, S. (2019).*Models and c oncept of curriculum implementation, some definitions and influence of implementation.*University of Cape Coast.retrieved online on 5/5/2023 at www.researchgate.net.

Bilal, M., Nikulina, O., &Gao, R. (2023). Why is Teaching Method Important? SCISPACE.https://typeset.io/questions/why-is-teaching-methods-important-odk5ywkdxit. retrieved on the 7/6/2o24

Federal Ministry of Education (2007). S*enior Secondary Education Chemistry Curriculum for SS1 – 3.* Abuja: Nigeria Educational Research and Development Council (NERDC) Press.

Federal Republic of Nigeria(2014). *National Policy on Education*.4th Edition. Lagos NERDC Press.

Helmenstine, A.M. (2020). What is the Importance of Chemistry. Thoughtco.com/what-is-the-importance-of-chemistry-604143.

Igwe I. O. (2015). Secondary education chemistry curriculum implementation in Nigeria: contending issues and innovative approaches for the future. *IJSAR - Journal of Life and Applied Sciences (IJSAR-JLAS*). 3(1) 24 - 33

Khan, A. and Soumya, K.G. (2016). Analysing the impact of poor teaching on students' performance. *International Conference on teaching Assessment and Learning For Engineering (TALE)* www.researchgate.net.

Mulenga, I.O. (2019). Conceptualization and definition of a curriculum.*Journal of Lexicography and Terminology*.2 (2).

Nbina, J.B. (2012). Analysis of poor Performance od Senior Secondary School Students in chemistry in Nigeria. *African Research Review*. 6(4)

Nevenglosky, E.A., Cale, C. and Aguilar, S.P. (2019). Barriers to effective curriculum implementation. *Higher Education Jounal*. 36.

Nnachi, E. (2023), Shortage of teachers, poor facilities threaten Ebonyi promising pupils' future. PunchNewspaper, 5th September, 2023.

Nwakpa, P (2010). An assessment of human and material resources availability in Ebonyi State university staff secondary school, Abakaliki.*Academic Excellence*. 1-11 Retrieved from www.globalacademicgroup.com on 12/3/2024.

Octavia, E.T., Ismiyati and Sholikan, M. (2019). How do school facilities affect schoolquality? Case study in vocational high school at Pati, Indonesia.*International Conference on Economics and Economics Education.*Vol 2020.

Olelewe, C.J. & Nzeadibe, A.C. (2015).*Challenges Facing the Availability and Utilization of ICT Resources in Poat Primary School in Nsukka Educational Zone of Enugu State*. America: University Press of America.

Pooja, G. (2017).Study the effect of teaching method on the academic achievement of school going children of semi urban area, Schools of Lucknow city. *International Journal of Home Science*.3(2) 447 -453.

Rocke, A. J., & Usselmam,M.C. (2023). What is Chemistry. Sage Journals: Macromarketing. 44(2)465-492.

School Dekho (2023). How *Poor Teaching Can Affect A Students' Academic Performance*.India: Dekho Phir Chuno.

Secondary Education Board (2024). Abakaliki: Statistics Department.

Selvan T. (2021).*Curriculum Implementation*. Alagappa Unuversity. Researchgate.net

State of Rhodes Island (2023).*Curriculum Definition, Office of the Governor*. Department of Education.curriculum@ride.ri.gov.

Sumera, M., and Mushtaq, M. (2017). Effectiveness of Reciprocal Teaching versus Traditional Teaching, Ponte *International Journal of Sciences and Reseach*, Rome Italy. 73(5) 135-159.

West African Secondary School Certificate Examination (2022). Ordinary Level Certificate Examination 2022 Chemistry Chief Examiners' report.Retrieved in 12/5/2023 from CD Registration Template.

Wiles, J.W. & Bondi, J.C. (2014).*Curriculum development*: A guide to practice(9th edition). Boston, M.A: Pearson.